

The Mining Journal

Established 1835

Railway & Commercial Gazette

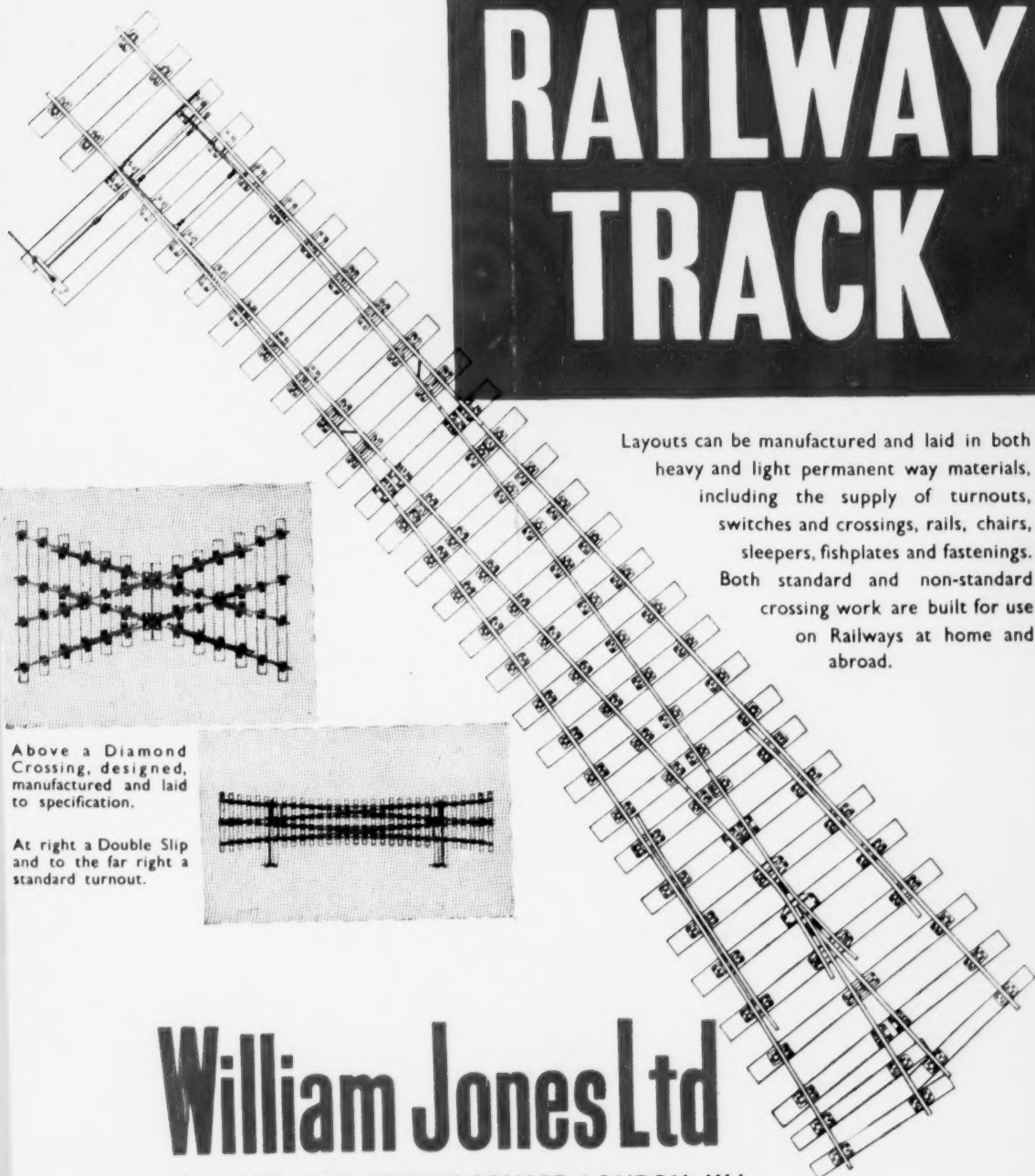
Vol. CCXLIV No. 6249

LONDON, MAY 27, 1955

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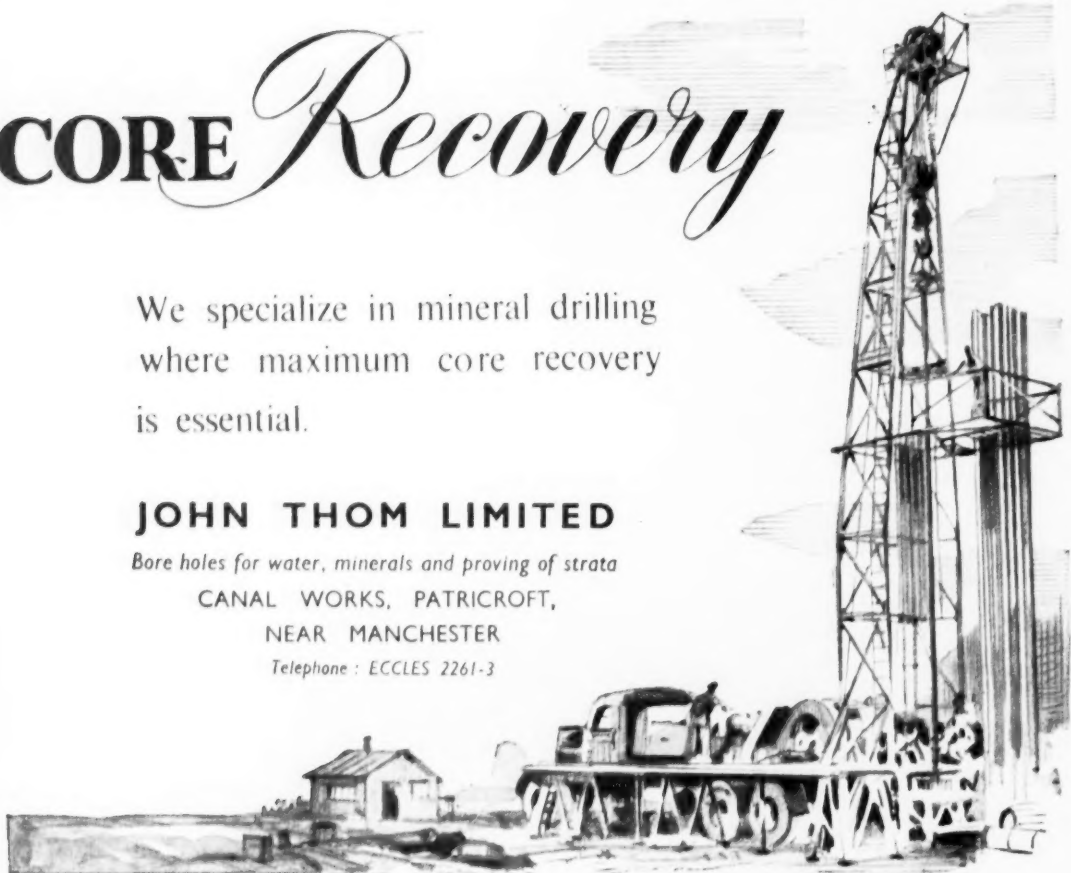
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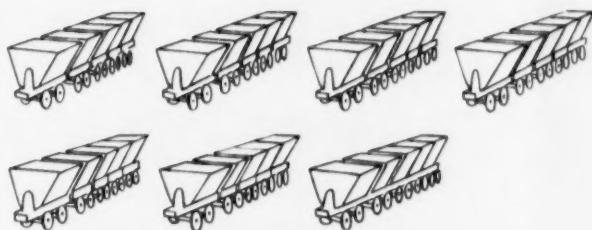
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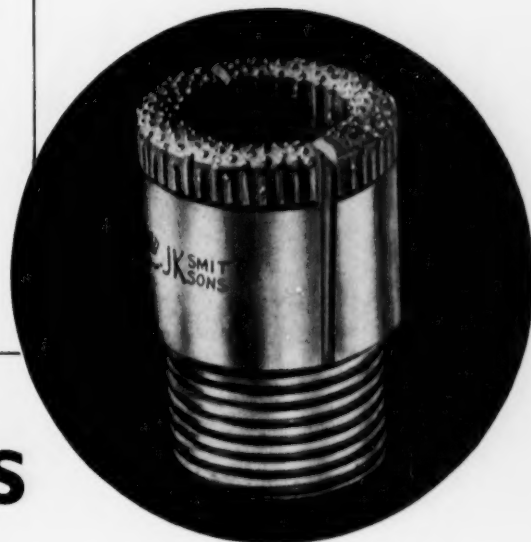
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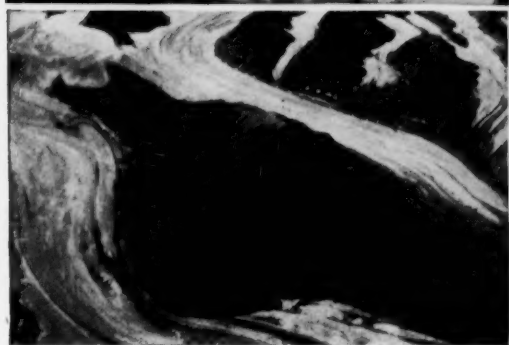
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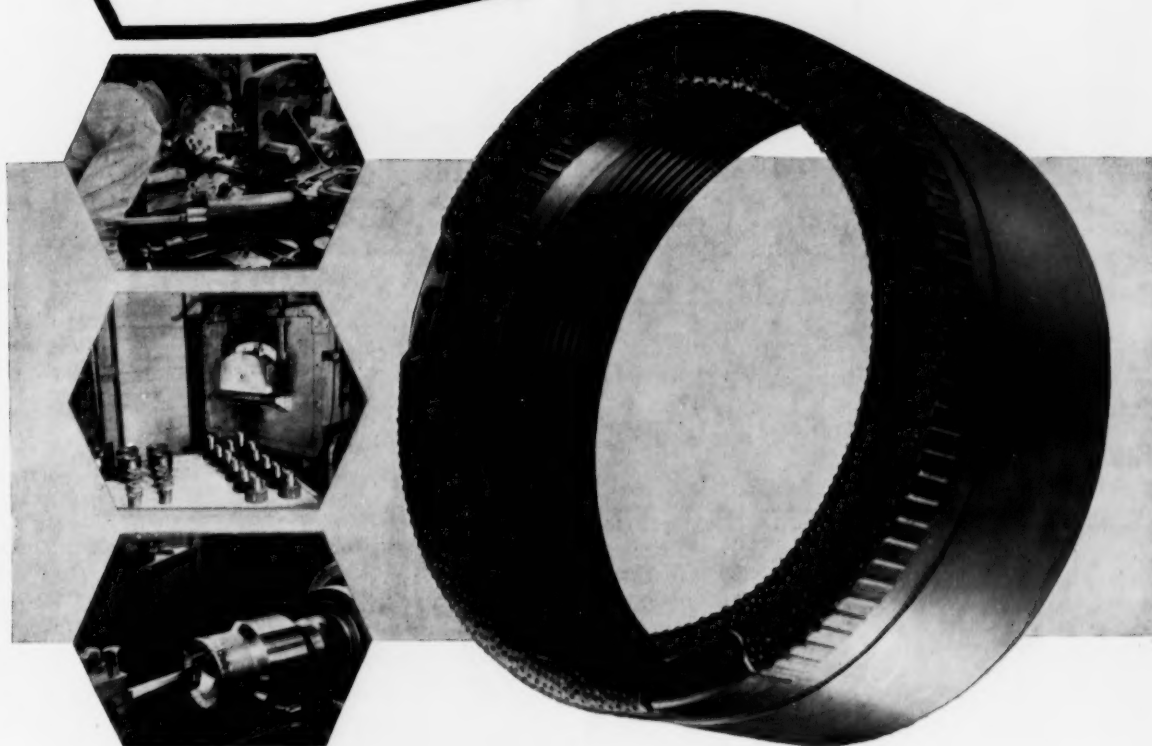
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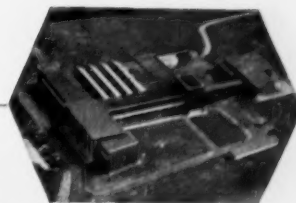
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NOTES AND COMMENTS

Atomic Power and the Mining Industry

Sir John Cockcroft's announcement that construction had started last week at Harwell of a new and more powerful heavy water reactor which would test fuels and materials for the atomic power production programme draws attention once more to the rapid rate of development in this field. Indeed, plans and forecasts are rendered obsolescent almost as soon as they are made. This is inevitable—although it makes it difficult for a layman to understand what is going on—for two reasons; the first is that full-scale production (Russia is already getting electric power from a small reactor and Britain and the United States are both building much bigger ones) is going on side by side with fundamental research in what is still largely unexplored territory; and the second is that the stakes are high and nobody can afford to let up.

Few industries stand to benefit more from this tremendous race than the mining industry. The possibility of laying on atomic power for the exploitation of isolated deposits of minerals can push back Paley's warning for a good many years. One of the major problems, for example, in tapping the mineral wealth of the polar icecaps lies in the absence of local power supplies, but it is becoming increasingly clear that, providing the other difficulties can be overcome, atomic energy can at least meet this one. Of course, atomic power may also produce some highly dubious consequences. If a compact nuclear power unit had been available ten years ago Bolivia might already have built her tin smelter.

It has seemed to many that British industry may lead the way in building atomic power stations and in exporting the equipment for building others overseas. This, too, is a development that British mining interests would welcome. At the present time the British lead appears substantial. Disregarding the Russian power plant (which is only a very small scale affair), Calder Hall was started over a year before the Americans started to build theirs. Furthermore, Britain is spurred on by an existing shortage of power which, without atomic energy, would develop into a crippling one. The United States, on the other hand, has abundant cheap electric power (and more yet to be tapped) and, at the present time at any rate, a comfortable surplus of coal, oil and natural gas. Consequently, the American effort has been directed in other channels;

the submarine *Nautilus* has been built, there is talk of building an atomic transatlantic liner and, more recently, an atomic locomotive.

But if Britain is clearly in the lead in building industrial power stations, the nature of that lead ought not to be misunderstood. For while so much fundamental research is still going on and daily affecting production plans, it should not be forgotten that in fundamental research the Americans have a huge advantage. Secondly, if American industry does not need atomic power the armed forces do. In Greenland, for instance, there is no ready source of power although the Americans have there one of their most vital bases. The United States Army has already awarded contracts for small power units which could be shipped by aircraft and erected where needed. In other words if British firms do not yet need to fear American industry they ought to have a healthy respect for the American armed services—and for the funds which they can command. Scaling up a small military power pack may be as easy as scaling down an industrial power station when the needs of a mine and its small community are being considered.

Expanding Industrial Demand Raises Silver Price

The recent strength of silver has not been due merely to short term fluctuations in international markets but to the persistent demand for the metal from the silver manufacturing industry.

In New York, the price of foreign silver has now reached 90.41 c. per oz.—the same price the U.S. Treasury pays for newly mined domestic silver. Although consumption of silver in the U.S. during 1954 in the arts and industry declined by as much as 20,000,000 oz. to 85,000,000 oz., industrial demand so far in 1955 has shown a considerable expansion. The broadening of demand this year has been largely for silver and high silver alloys used by the electrical and electronics industries for contacts and other purposes. Demand for silver brazing alloys has also been good but the offtake from silverware makers, although better than last year, has not gained spectacularly.

On top of the stronger demand situation now evident, London has also made calls on the New York market over the past few weeks for large amounts of foreign silver—the explanation for this being that previous supplies re-

ceived from Soviet sources have been absorbed. More than that, available supplies of silver, particularly from Mexico, have been reduced. That supplies from Mexico are short is particularly important, as not only does the Bank of Mexico exercise an important influence in stabilizing the silver price, but it also represents one of the most important sources of U.S. supplies.

Silver stocks held by the Bank of Mexico have diminished appreciably over the past year or so and when Saudi Arabia contracted to purchase 17,000,000 oz. from Mexico earlier this year for minting coins, the Mexican official supply position was so reduced as to prevent the Bank of Mexico from continuing its traditional policy of supplying the New York market to keep the silver price stable. Moreover, this position was worsened by the recent contract for Mexican silver from West Germany requiring delivery of somewhere between 8,000,000 and 10,000,000 oz. this year. In the normal course of events, this amount would have been taken care of out of government stocks but with these depleted, Mexico has not been able to meet its contractual obligations and also supply the U.S. market.

All that being so, foreign silver in New York so far this month has risen 3.16 c. per oz. to its present price of 90.41 c. per oz. for commercial bar silver.

The *American Metal Market* in commenting on whether the matching of the foreign price for silver with the U.S. Treasury price will make substantial supplies of U.S. domestically mined silver available to industry stated that this would depend largely on the additional transportation costs involved. A large proportion of the 37,000,000 oz. of silver produced in the United States annually is refined on the West coast and it would cost about 1½ c. an oz. to bring the silver to the major consuming markets on the Eastern seaboard. On the other hand, quite substantial amounts of domestically mined silver are refined in the East and supplies from this source would most likely be made available to industry if it was more advantageous to sell to industry rather than to the Mint.

A Steel Industry for South Australia?

The desire of the South Australian Government to establish a steel industry in that State, is being advanced. Negotiations with the Broken Hill Proprietary Co. Ltd. have been in progress with that object, and it has been suggested that the State should take over that company's leases, and plant at Whyalla, mine iron ore itself, and sell it to the Broken Hill Proprietary Co. while, at the same time operating its own steel works. This, despite the fact that the B.H.P. has established a fine town at Whyalla for the shipment of iron ore to the works on the east coast of New South Wales, a modern iron smelting plant, and important shipbuilding yards.

The argument for the State project has been advanced by the South Australian Government because of the reported large deposit of high grade iron ore north of the Broken Hill Proprietary Co.'s Iron Knob leases. This has introduced an alternative which the State intends to follow up, that an outside company may be invited to establish an iron and steel industry in the State.

At the same time, a graziers' association in the Eastern States has advocated the formation of a new steel company to compete with the B.H.P. Co. and that that company's high grade iron ore deposits should be cancelled and fresh leases issued to that company.

This agitation has been fostered by the shortage of steel in Australia, but what is not appreciated is that in post-war years there has been a steeply rising demand for steel in this country; that the Broken Hill Proprietary Co. has increased its output of steel by 50 per cent in the last few years, production being now 2,250,000 tons, with a further 350,000 tons expected by the end of 1956.

Portugal

Foz do Douro, May 10.

During the period January/March the position of the mineral industry in Portugal was one of waiting and seeing. The U.K. headed the list in imports of Portuguese tungsten-bearing materials with 126 tons, Germany being second with 55 tons. The United States took 44 tons. It was only in February, when interest in U.K. business ceased, that the U.S. began to show interest. By and large, exports of tungsten ores cannot be said to be booming.

Exports of cassiterite slumped badly, nothing having been sent out of the country during January. The New Corporation, brought into existence for the purpose of producing iron, steel and sheet tin materials, said a great deal about its future plans for using local material for producing all three minerals. Production is expected to start late in 1956.

THE TUNGSTEN SHORTAGE

The following remarks, although dealing exclusively with Portugal, may to a certain extent account for apparently inexplicable shortages of the subject material. From January, 1939, to September, 1944, Portugal produced almost 32,000 tonnes of tungsten bearing ores, about 50 per cent of which was collected by the "tributers," who are usually agricultural workers and experts at collecting ores.

When the price per kilo of crudely washed concentrate, as brought in by the tributer, can be paid for by the concession owner or speculator at a higher price than that which the tributer can earn by working on the land, thousands of tributers find a remunerative occupation by scratching and picking.

Under normal conditions, the concession owner, with a very few exceptions, cannot afford to employ more than a limited number of permanent workers, a state of affairs that possibly occurs in other producing countries. Only when the price enables the small mine owner to offer a high price for the ore collected can the output be increased, by buying from the tributer. A mine may produce five tons per month at normal prices, but an increase means calling in say 20 tributers when the output goes up to 10 tons per month. The price falls, the tributer returns to land work and down goes the production to the normal five tons.

The last 12 months has witnessed a typical example of this phenomenon. It is a fact that few mine owners here possess adequate working capital, neither is there any special inducement to install expensive machinery with a view to increasing production and reducing the permanent staff. This is the position as far as Portugal is concerned.

It is expected that within three years at the most the erection of the plant for the production of iron, steel and tinplate will be completed, and the yearly expenditure of some £10,000,000 required for the payment of imports at their present rate will be saved by the country. As matters stand, Portugal is exporting iron-bearing material and buying it back again plus the charges for recovery of the metal content and the conversion of that content into the finished article.

The United Kingdom, Germany and Italy are the principal buyers of Portuguese ferrous material, but Belgium-Luxemburg heads the list of sellers to Portugal of sheet iron and steel with 59 per cent of the total, France coming second with 20 per cent, and the U.K. with seven per cent. Regarding imports of tinplate, the United States supplies 74 per cent, the U.K. 16 per cent, and France eight per cent.

The proposed plant will manufacture tinplate from cassiterite won and smelted locally. It is not known whether

the export of cassiterite will be allowed after the plant commences production. Local industry consumes about 22,000 tons each year, 20,000 tons being consumed by the fish, fruit and other canning industries. The State will hold 50 per cent of the shares in the new corporation so the usual shortage of ready capital will be avoided. As regards the quality of Portuguese haematite and magnetite, official figures give the average as being 50 per cent. The cassiterite is of high grade.

The principal iron ore deposits are not located in very accessible districts or near main line rail heads. Nothing is known so far as to the precise locality where the furnaces will be erected, but is presumed that these will be as close as possible to the mines. Power, it is presumed, will be derived from the new dam under construction on the River Douro. On paper the plan is undoubtedly a benefit to Portugal, but the most optimistic realize that a great many iron and steel articles will still have to be imported.

Canada

(From Our Own Correspondent)

Sudbury, May 9.

In the steadily expanding mining industry of Canada increasing attention is being directed towards uranium. The latest enterprise to make plans for production on a big scale is Consolidated Denison with property comprising some five miles in length in the Blind River area of Northern Ontario. The company has made provision for over \$25,000,000 with which to round out an extensive development programme and erect a mill of 4,000 tons daily capacity. Eight diamond drill rigs are in operation, and the indications are that estimates of ore tonnage may be forthcoming before the end of June, at which time negotiations will be in order for a contract with the Canadian government for sale of the product.

Officials have intimated the likelihood of 10,000,000 tons of ore being outlined within the next few weeks—and with an indicated potential of several times that amount. The results of work at this time appear to be sufficient to suggest that Consolidated Denison is not only to rank high among the major uranium-producing mines in Canada but also among mining enterprises of all categories.

LITHIUM FROM QUEBEC

Lithium production is scheduled to begin late this year from the property of Quebec Lithium Corporation in Northern Quebec. The shaft has been completed to 525 ft. depth where lateral work is now extending out toward the orebodies. Construction of a mill of 800 tons daily capacity is making good progress, and so designed as to be increased readily to 1,500 tons daily if required. The treasury of \$3,450,000 promises to be sufficient to fully cover all development and construction costs. A five-year contract for sale of lithium concentrates to Lithium Corporation of America assures continuity of operation, calling for 165 tons of concentrates per day which is expected to be obtained from handling 800 tons of ore daily. Quebec Lithium Corporation will be the first lithium producer in Canada, and already the company is considering the possibility of establishing a chemical processing plant in Canada. Suggestions have been made that lithium carbonate may be produced at a cost of 25 c. per lb. and that lithium metal may be produced at a cost of around \$3 per lb. The outlook is that standard flotation process will be used in the mill, resulting in recovery of 80 per cent of the spodumene, and resulting in a concentrate of five per cent lithium oxide.

Columbium production is nearing reality at the Beaucage Mines property in Northern Ontario. Working from an

island some five miles offshore on Lake Nipissing at the front of the city or North Bay a shaft was put down 400 ft. where crosscutting and drifting is proceeding at a rate of about 600 ft. per month. Meanwhile, on the mainland a pilot mill is in course of erection. This small unit is expected to be ready for operation in August, embracing facilities for chemical tests as well as flotation. The results to be obtained from the pilot plant promise to be of vital concern to prospective producers of columbium in this country—and will govern vital decisions bearing upon the future development of Beaucage Mines which is a subsidiary of Inspiration Mining and Development Co.

Iron ore shipments for the current summer season have commenced from the Labrador-Quebec iron range. The objective from this source for the current season is 6,000,000 to 7,000,000 tons. Meanwhile, with major mining operations now fully established in the very heart of a vast territory which has remained virgin up to this time is serving as a beacon to prospectors and explorers in considerable numbers—marking the beginning of a new era for the north-easterly part of the continent of North America.

Pronto Uranium Mines is maintaining development and construction schedules designed to place the company's Blind River property in production within the next four months at an initial capacity of 1,000 tons of ore per day.

BRIGHT OUTLOOK FOR FALCONBRIDGE

Falconbridge Nickel Mines at Sudbury is operating at a rate of about 120,000 tons of ore per month for average monthly sales of some \$3,300,000. At the beginning of this year the company's working capital had risen to approximately \$10,000,000. Having ore reserves of 35,515,700 tons at the beginning of 1955 and drawing ore at a rate of some 1,400,000 tons annually, a long life of high productivity lies ahead. During 1954 the company's mines shipped 38,790,538 lb. of nickel and 22,486,142 lb. of copper and treated 1,407,909 tons of ore. Gross value of metal sales during 1954, including by-products as well as nickel and copper, amounted to \$39,317,333. Operating profit was \$11,157,480. This was reduced to \$4,660,945 in net profit after providing for taxation, depreciation, exploration and other write-offs.

Sherritt Gordon Mines, having spent some \$43,000,000 in preparing its Lynn Lake Mine for production, is now in full stride and with the plant operating at 10 per cent above estimated capacity. Output for the first quarter of 1955 was \$4,536,661 and resulted in net profit of \$1,368,884 after write-offs, thus establishing the Lynn Lake mine as the third largest nickel producing enterprise in Canada.

Oceanic Iron Ore of Canada Ltd. in mid-May was sending a field force of 20 men to Ungava Bay to undertake further exploration of deposits discovered during the summer of 1954. Preliminary work last year indicated 300,000,000 tons containing some 30 per cent iron. While the ore is low grade, yet the deposit lies close to tidewater and is available for open pit mining. An additional \$500,000 was recently placed in the company treasury through sale of 500,000 shares. The deposits are near the mouth of the Payne River at a point some 300 miles north of the iron ranges of Quebec and Labrador which came into production in 1954.

Brunswick Mining and Smelting Co. has operated its pilot mill of 150 tons daily capacity for close to three months as a means of gathering data upon which to base plans for ultimate construction of the large reduction works required to treat the 50,000,000 tons of ore so far indicated. Excavations are proceeding in the removal of surface overburden from one area where an estimated 6,000,000 tons of ore may be removed by open pit mining to a depth of 200 ft. Leadridge Mining Co. is to provide \$7,500,000 towards the cost of development and construction.

An Experiment in High Speed Tunnelling

An increase on the footages previously achieved in tunnelling operations was announced during April by Marples, Ridgway and Partners Ltd. during work on the Allt-na-Lairige project of the North of Scotland Hydro-Electric Board when during the seven days commencing March 31, 1955, a distance of 444 ft. was advanced through granite in the tunnel forming part of the project. Several aspects of the operation are of particular interest, namely the high air pressure used, the rapid ventilation clearance and the shuttle car designed and built by the contractors which cleared the entire pile and eliminated car changing. The following article describes the tunnelling operation in the Allt-na-Lairige project and indicates that the possibility exists for improvement in existing tunnelling methods.

An experiment recently undertaken by the contractors was concluded this spring at the Allt-na-Lairige tunnel in Argyle.

The Allt-na-Lairige tunnel forms part of a scheme which, although not one of the major hydro-electric works now under way in Scotland, has some unusual features including a pre-stressed dam, the first of its kind in Western Europe. The tunnel will convey water 6,600 ft. through a hill to the penstock where it drops some 700 ft. to the turbines. From this point it drops into Glen Fyne.

Methods employed in driving this tunnel included unusually high air pressures for drilling and loading and the use of a special shuttle car, designed and built by the contractors to take the complete round. This car has a hydraulically propelled slat floor which moves the rock slowly back as required to make room for new fill.

The tunnel is only 8 ft. high by 6 ft. 6 in. wide and had to be driven through granite. This small section, and the nature of the rock, made a pull of much more than 7 to 8 ft. per cycle unlikely but it was decided, despite these somewhat unfavourable conditions, to attempt a high speed face advance.

Attention was directed to the drilling and mucking parts of the cycle which take a high proportion of the total cycle time. Air pressure was substantially increased, supply pressure being raised from a normal 80 p.s.i. or so to 115 p.s.i. at the face. The rock drill is already a highly-stressed piece of equipment but it was decided to risk premature breakages.

DRILLING EQUIPMENT

Holman "Silver 3" airleg mounted Handrils were chosen for this work and three machines were employed to drill the average 21 hole pattern with a further three standbys used in rotation. At the completion of the tunnel each "Silver 3" had drilled approximately 30,000 ft.

Tungsten carbide tipped Holsteels of $\frac{1}{4}$ in. hexagon section with $1\frac{1}{2}$ in. diameter bits were employed. To avoid loss of time on changing, 8 ft. steels only were used throughout, and a check near the end of the work indicated that the average life was then about 300 ft. It was found that the 8 ft. holes could be consistently drilled in just over four minutes, and the overall drilling speeds—includ-

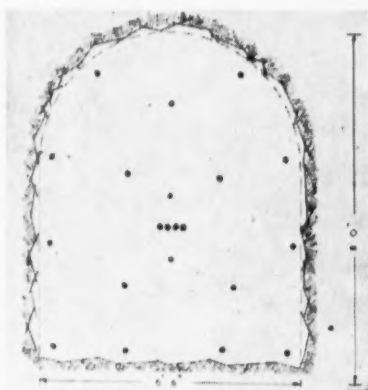
ing time for moving from hole to hole—were 18 to 20 in. per min. throughout the work. Total drilling time was thus cut to under 35 min. per cycle.

SPECIAL SHUTTLE CAR

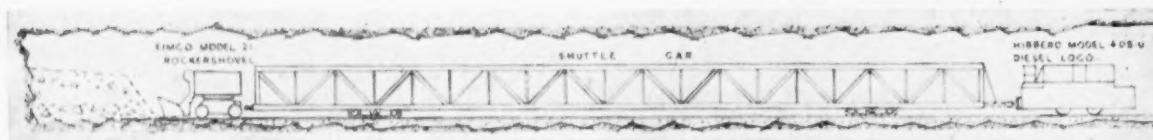
Broken rock was loaded out with an Eimco Model 21 Rocker Shovel. The tunnel size is approximately the minimum for this machine and the loading rate was high, particularly with the increased air pressure, but overall speeds are dictated largely by the facilities for removing spoil from behind it. The width of tunnel here prevented any possibility of fast car-changing. It was felt that any of the usual methods of car-changing result in more loss of time than is generally recognized, and it was expected that the special shuttle car would ensure continuous loading out. The main frame of this car is 70 ft. long and is carried on two 8-wheel bogies. The chassis is supported on stub-axes integral with the bogie frame. The floor of the body consists of a steel slat conveyor-belt on rollers, propelled by hydraulic rams. The loaded rock is thus moved steadily back as required to make room for the new fill. The load moves as a rectangular mass about 3 ft. deep between the vertical side walls, which are 4 ft. 6 in. apart and is discharged through a space at the bottom of the car at the rear into tubs of 2 cu. yd. capacity. Satisfactory working of the car was not achieved without various delays and modifications. Mucking times before and after the introduction of the special car make an interesting comparison. The best time of about 80 minutes was reduced to 40 minutes for the same depth of pull.

Towing was by a modified version of the 38 h.p. 4 DS-U diesel underground locomotive, supplied by Messrs. F. C. Hibberd and Co., Ltd., who also collaborated in designing the remote controls which could be operated from the loading end of the car 70 ft. away. This system proved satisfactory. Hydraulic power for the conveyor belt was taken from an engine-driven pump incorporated in the locomotive.

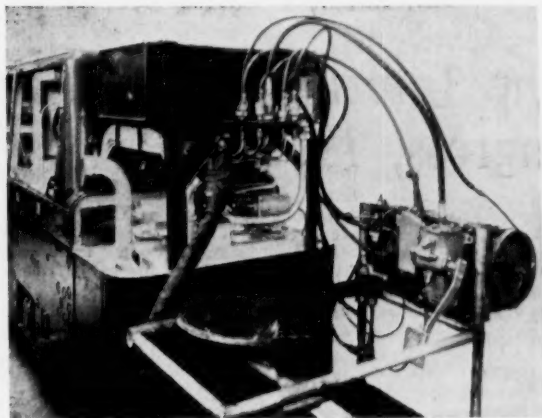
Still further time was saved by the high capacity of the ventilation system. The supply was stepped-up to the exceptional figure, for this face area, of 7,500 cu. ft. per min. operating at a pressure of 60 in. water gauge. Two Holmes



The drilling pattern normally used



Side elevation to scale of the loader, car and loco at the face



Remote control gear for loco operation

lobe-type blowers of 35 and 85 h.p. were used. Both were run to clear gas after blasting and during the mucking period and re-entry to an entirely smoke-free place was possible within 10 minutes after firing.

Ventilation and compressed air pipes were chain-slung from the roof by eye bolts screwed into $\frac{1}{2}$ in. dia. Rawl-plugs. The holes for these were drilled with a small Holman "Silver 8" Handril mounted directly on the piston rod end of one of the manufacturers' airlegs to form a light stoper drill.

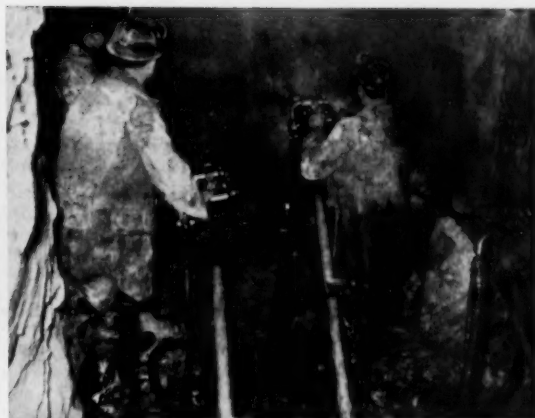
NORMAL PROCEDURE

Other features of the work followed normal practice. Although shorter working hours might have improved times still further, the usual 12-hour shift system was employed. Face labour requirements were small, the crews being made up of one shift boss, three drillers, two spanner men, one loader operator, one loco driver, one handyman—a total of nine men.

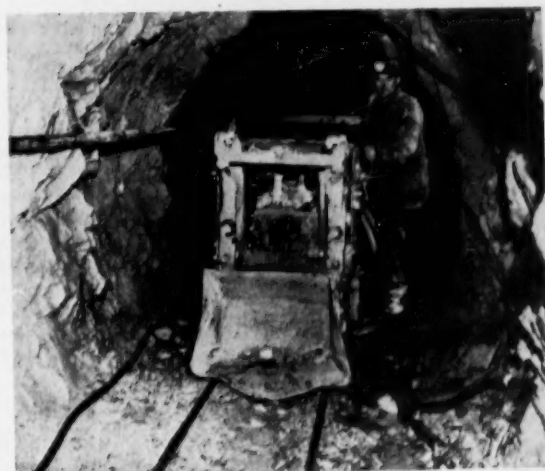
By the time the shuttle-car was in regular service, cycle times were so short that an attempt was made at an optimum figure for a working week. During the seven-day period commencing March 31, 67 cycles were completed, despite loss of more than a shift on rectifying minor faults on the car. In the seven days the tunnel was driven 444 ft. This improvement on the then standing figure of 428 ft. is claimed as a record. Had the tunnel not then been almost completed, further improvements reasonably could have been expected. The table below shows a comparison of cycle times.

Particular Operation	Best Week: small car (minutes)	Record Week: large car (minutes)
Clear Smoke	15	12
Prepare to muck	11.5	10
Muck	80	42
Prepare to drill	5	5
Drill	34	35
Charge and Fire	20	20
Lay rails	9.5	8
Total	175	132

The general results confirmed the contractors' belief that there is room for improvement on normal tunnelling methods, and validated the somewhat expensive experimental work on the large shuttle-car. The tunnel is now complete but plans are in hand for further development and marketing of the car and it is thought that much larger sizes could be made on the same principle.



Easy balance of "Silver 3" operators



Eimco rocker shovel approaching pile



Operating Holman "Silver 3" at 115 p.s.i.

GOSLAR ORE DRESSING CONGRESS—I

Papers Presented at the International Ore Dressing Congress, 1955

In an article appearing in *The Mining Journal* of May 20, our representative at the International Ore Dressing Congress held at Goslar, Hartz district, Western Germany, described the opening of the Congress and gave a resumé of the agenda following. The article appearing herewith is forwarded from the same source, and presents in précis those papers discussed during the proceedings of the first day and the majority of those discussed on the second day. A subsequent article will present summaries of the remaining papers presented on the second day together with the main points of the papers discussed on the third day, as well as two papers which were not subjected to discussion at the Congress. A description of the plants visited by members will be published in due course.

Before the International Ore Dressing Congress at Goslar closed, it was suggested that an attempt be made by member countries to translate the papers presented in full into English and French, and possibly to provide a glossary of technical terms in these languages together with German.

It was further suggested that a Secretariat be set up in Europe for assessing and documenting information dealing with mineral dressing and including the various research activities being carried out in the member countries. It was estimated that this service would cost 70,000 DM. per annum.

The full composition of the Congress, by nationalities, was as follows: Belgium, 25 representatives, Germany 239, United Kingdom 24, France 45, Holland 9, Sweden and Italy 19 each, Yugoslavia and Norway 20 each, Austria 16, Spain and the United States 4 each. Rhodesia and Saarland were each represented by 2 members and Cyprus, Finland, Greece, India, Israel, Luxembourg and Portugal by one. A total of 450 members attended.

PAPERS PRESENTED ON THE FIRST DAY OF THE ORE DRESSING CONGRESS

Reduction of Operating Costs by Pre-concentration as Illustrated by the Mechernich operations, by E. Puffe: In this paper the author describes the way in which the new plant at Mechernich utilizes various pre-concentration methods before fine grinding and flotation.

Flotation requires fine grinding and such grinding is expensive. For this reason fine grinding and all flotation plants could not be recommended for abrasive or very low grade ores, and the value of pre-concentration is likely to increase with the progressive depletion of the richer deposits. Such pre-concentration may also be of advantage for ores containing minerals having a poor floatability.

Any pre-concentration process should fulfil the following conditions:

- (a) It must be cheap to operate
- (b) It should necessitate only little preliminary size reduction
- (c) It should yield a low grade tailing
- (d) It should be fool-proof and not too sensitive to fluctuations in the feed rate or to ore characteristics.

Such methods are heavy media separation (including the use of cyclones), selective crushing especially in impact mill or rod mills, the use of Humphreys spirals and for finer sizes, tilting tables.

The author then described the Mechernich plant, which utilizes selective crushing in impact mills coupled with screening when a considerable amount of oversize cannot be rejected, gravity separation in heavy media cyclones for material between 8 and one mm., and the separation of quartzite sand between 0.5 and 0.1 mm. using Humphreys

spirals. Material between 1.0 and 0.5 mm. is not pre-concentrated, but only represented a small proportion of the feed.

The concentrated ore from these various processes then goes to the grinding plant followed by flotation, where the galena is floated in the normal manner recovering cerrusite by using sulphidising. In the flotation section the granular fraction from the grinding circuit is kept separate from the slime fraction during flotation.

Control of Grinding in the Ball Mill, by E. J. Pryor: The main factors affecting liberation of particles and development of their size during wet grinding were considered in this paper. Starting with suitable blending of the ore, the need of a regular feed to the mill and control of the ratio of the new feed to circulating load was considered whilst the use of the rod mill before ball milling was mentioned.

In the mill itself, factors of design, factors capable of slow adjustment and factors requiring running adjustment by the shift operator were itemised. The other factors such as the type of mill, the percentage of critical feed, ball sizes and the weight of the ball load, and types of liners were also noted. The author pointed out that the final criterion of improved grinding should be increased profit and yield.

Grinding Investigations at Malmberget, by B. Fayerberg: In this paper the grinding of magnetite ore was discussed and after a short description of the equipment and the test work, the author analysed the results. The more important items were:—

- (a) The production of new surface area becomes more difficult the finer a material is ground.
- (b) A relatively high water content is favourable for the control of oversize in rod-milling. In a ball mill with fine feed a thick pulp promotes more new surface per unit time and per unit energy.
- (c) The new surface produced in fine grinding is 15 to 25 per cent greater when low-level ball-mills are used instead of overflow mills, but probably takes place at the cost of greater wear per ton. Energy requirements are not noticeably affected by the pulp level.
- (d) From an economic point of view a charge of 40 to 45 per cent of the volume is best for fine milling but 43-50 per cent probably gives a maximum capacity.
- (e) Within certain limits, increased specific surface of grinding media results in higher capacity and less energy consumption per ton both for ball and rod-mills.
- (f) Capacity increases with speed up to 100 per cent of the critical but probably occurs at expense of economy above 70 per cent.
- (g) Liner design affects the production of new surface and smooth types are recommended at least for high speeds.

- (h) The production of new surface is proportional to the mill length and to the mill diameter as 2.5.
- (i) The production of new surface is not noticeably influenced by closing a ball mill circuit with a classifier.
- (j) As energy consumption and wear in fine milling seems to be a minimum at lower speeds, higher pulp levels and lower charge volumes than would be recommended for a maximum capacity, some scope should be left in planning new plants in order to obtain optimum conditions with regard to costs.

The New German Standards for the Graphic Representation of Size Distribution, by S. Kiesskalt: In this paper a new method of graphical representation was described and compared with other systems. The new system is based on the Rosin-Rammler empirical system.

Experiences with Xanthates of Higher Alcohols, by G. Exberich: Information gained on the proper application of xanthates, especially those of higher alcohols, was discussed, and the author found that there appears to be no universal rule for the application of different xanthate. In most cases the results obtained fall short of theoretical expectations whilst the choice of reagents often produces remarkable effects in flotation plants.

It is generally thought that the activity of the xanthate increases with the length of the carbon chain but in practice however, the efficiencies of individual xanthates diverge considerably from this law. In test, with pure xanthates and treating sphalerite, the recovery increased with increasing length of the carbon chain but this did not hold true for commercial xanthates.

In the case of galena results follow the theoretical law more closely but with pyrite both in lime-alkaline and in acid circuits, the longer chain xanthates failed to be efficient.

It was pointed out that when using mixed xanthates it is generally best to add the weaker member to the first cells and the stronger reagent at a later stage as mixed solutions fail to be useful.

The Separation by Flotation of Pyrite and Arsenopyrite in Dressing Complex Ores, by H. Kirchberg: The writer points out that it is often difficult to utilize pyrite from complex ores because of the arsenic content, and methods of effecting a separation are discussed, either involving depression of arsenopyrite or causing it to float ahead of the pyrite. The fact that the flotation properties of pyrite vary considerably makes it difficult to lay down any definite rule. Tests on a pyritic lead ore of Freiberg were carried out at the mining academy there, using material carrying 2 to 14 per cent.

On low arsenic ores, amyl xanthate was found to be the best collector provided soda ash is employed to maintain alkalinity instead of lime at a pH of 8.0 when most of the arsenic is depressed. With lower xanthates, however, the separation is not as satisfactory. With a higher arsenic content even when as low as 3 to 4 per cent, the process failed but the author says it appears possible to lower the arsenic content by using a combination of tabling and flotation. This may be satisfactory on some ores but fails if much of the copper is present as chalcocite.

Yet another method suggested is to activate the arsenopyrite in a lime-alkaline pulp with copper sulphate when a concentrate containing 30 per cent As. was made and recovering over 70 per cent of the arsenic.

The papers discussed on the second day of the Congress included the following. The remainder will be published in next week's issue.

PAPERS PRESENTED ON THE SECOND DAY OF THE ORE DRESSING CONGRESS

Dressing Problems in the German Potash Industry, by R. Bachmann: The use of gravity differential in separating potash minerals is described employing a hydrocyclone with a medium having a density of 1.64. Such treatment produces a good separation when the intergrowth is coarse.

A separation was also obtained with sylvite and halite whilst table-flotation has also been tested floating the sylvite with a non-polar oil after it had been rendered hydrophobic. Unfortunately, the throughput is low—500 kg. per sq. m. per hr.—and this factor combined with reagent cost forbids a large scale use of this method.

The writer then points out that flotation is best as it operates over a wide size range (1 mm. down), and any saving by using a coarser separation is not justified in view of the low grinding costs.

The Intergrowth in German Potash Minerals, by R. Kuhn: In this paper the author said that the really profitable minerals were carnallite and the sylvinites. Rock salt was always present as a gangue mineral and as an additional pay-mineral, and knowledge of the degree of intergrowth was important.

A technique for staining potash minerals was described using Malachite green and dipikrylamine when it was possible to discern the potash containing minerals by its strong red colour, down to 0.1 mm. in size. When dealing with polished sections, an intergrowth index had been worked out.

The practical importance in the dressing industry lay in the investigation of degree of liberation of ground samples. This was done by counting the grains and quantitatively estimating the share of intergrowth in grain samples of screen fractions.

The liberation is plotted against the particle size as a curve and it could be shown that these liberation curves are practically independent of the method of grinding whilst approximate empirical mathematical relations between the index of intergrowth and the degree of liberation may be derived, if the material is always comminuted in the same manner.

Practical Experience with Electrostatic Separation, by A. Stieler: In this paper the history of the development of the process was outlined and was followed by a description of various commercial machines. In most cases, the machines were of the one or multi-roll type but the slot or venetian-blind type developed by the Lurgi Co. of Frankfurt a.M. as well as the plate type developed at Melbourne University were also described.

The second part of the paper dealt with the application of electrostatic separation and results on monazite concentrate and scheelite were given. During recent years the method has been applied to non-metallic minerals. Such minerals are usually electrically inactive and it is necessary to pretreat the feed in order to modify the conductivity. This modified process was now operating satisfactorily in a dry dressing plant of a Bavarian kaolin works where the dried residues from the kaolin plant are separated into a pure quartz sand and a ceramic felspar. In a similar way it is claimed that such minerals as fluorspar barite, kyanite, mica, talc, and asbestos can be treated.

Operating costs are lower than magnetic separation being about one half for the actual separation. Drying, however, accounts for most of the cost and the total cost might amount to 1.00 to 2.00 DM. per ton. When the ore requires pretreatment the total cost may be as much as 3 to 4 DM. per ton.

New Steel Records in the United Kingdom and the United States

(From Our Iron and Steel Correspondent)

The steel boom has not yet reached its zenith. That is now the considered opinion of operators on both sides of the Atlantic. In the United Kingdom ingot production during the past three months has been running at the rate of 20,500,000 tons per annum—a 1,000,000 tons in excess of the target figure for the year, yet in spite of this near famine conditions prevail. Deliveries fall so far short of requirements that many important industries are starving for steel, exports must perforce be restricted, big tonnages of foreign pig iron, steel semis and finished products have been purchased for shipment in the second half of the year, and in planning to increase capacity to 22,500,000 tons in 1958, the British Iron and Steel Federation is now accused of short budgeting.

The accusation is not entirely without foundation. Human judgments are at all times fallible and both British producers and their competitors overseas have been taken aback by the enormous demand which has developed. But this country was first in the field with a post-war development plan conceived on bold comprehensive lines and is now reaping the fruits of its enterprise. The development plan moreover was at all times flexible. It did not represent finality and in the light of the now ascertained facts and in particular the growth of the flat steel requirements of the motor industry, the second development plan is in process of revision.

A proposal to raise the capacity of John Summers steel sheet works at Shotton by a further 300,000 tons to 1,150,000 tons is now awaiting the final approval of the Iron and Steel Board and it is believed that extra outputs on a similar scale can be squeezed out of the mills at Margam and Ebbw Vale. This will allow more time for consideration of a proposal to lay down a fourth continuous wide strip mill which with all its ancillaries in iron and steel making facilities might involve a total expenditure of £100,000,000. High construction costs will not, it is affirmed, halt progress, but capital expenditures of this magnitude are not to be undertaken lightly since redundancy can be an expensive luxury.

INCREASED EXPORTS FROM EUROPE

Reports from Europe indicate that the volume of new orders booked by Continental mills has slightly moderated since the turn of the year, but the works are all very busy and in the annual report of the European Coal and Steel Community it is claimed that the removal of restrictions has resulted in an increase in 1954 of 50 per cent in the exports of steel to markets in the Community.

Still more impressive is the rate of recovery in the United States. Contrary to the usual experience American steel was the last to run into smooth waters. The recession after the Korean war was pronounced. Last year American ingot production averaged no more than 71 per cent of rated capacity and it was widely thought that the industry had enough capacity under construction or in operation to provide for all requirements for the next five years.

This month the operating rate has been raised to 96.6 per cent, one week's output produced 2,331,000 tons which exceeded the previous record in March 1953 by 7,000 tons, and with the outlook still brightening, spending on new plant this year is expected to increase by 5 per cent.

Looking still further ahead Mr. Ernest T. Weir, chairman of the National Steel Corporation, told a stock holders meeting that the United States probable ingot capacity requirements at the end of the century would be no less than 200,000,000 tons, an increase of 75,000,000 tons over the present rate of output.

A consideration of immediate moment is the formal application of the steel workers' union for an advance on the hourly rate of pay. June 30 is the indicated deadline for a strike if agreement is not reached, but a stoppage is not anticipated as the steel makers are believed to be in the mood for concessions provided that steel prices are adjusted to meet higher wage costs.

RAW MATERIALS SUPPLY

There remains the immense problems involved in the acquisition and mobilization of the vast tonnages of raw materials which are required to sustain steel production at present record levels. Coal supplies are precarious, and imports of iron ore in the first quarter of this year were actually 230,000 tons below the figures for the corresponding period of last year. To some small extent raisings of home ores have been increased, but it is obvious that very much bigger tonnages of foreign ores are required and, subject to the freer availability of transport, are assured.

The scrap position is much more difficult. Owing to the extreme scarcity of pig iron, supplies of pig iron are now rationed and both the steel makers and the foundries are using more scrap. Hitherto they have been able to draw upon their reserve stocks but this process cannot be continued indefinitely. Indeed the tonnages in stock are at the lowest level for several years past. Moreover it is becoming more and more difficult to buy scrap on the Continent, where all available tonnages are eagerly taken up for local consumption.

An important steel development abroad is the approval of a plan for the installation of a new steel plant on a 1,350 acre site at Piassaguera in Brazil four miles from the Atlantic port of Santos with which it is connected by a lagoon. A channel accessible to 10,000 ton steamers is to be dredged. A 25,000 Kw. thermal power station will be built and the total cost of the project is put at £20,000,000. The installations are designed to produce 300,000 tons of finished products annually, and capacity is to be raised by stages to 1,000,000 tons. Our requirements estimated at 1,600 tons daily rising to 5,000 tons will be drawn from the Itabira deposits with an average Fe content of 65 per cent, and coking coal will be supplied from Santa Catarina with an admixture of imported coal from U.S.A.

In Germany two gaps in the technical equipment of the steel industry have been filled by the initial operation of the £10,000,000 continuous broad strip mill built for Thyssen's, and Capeto and Klein £6,000,000 semi continuous stainless strip mill, to start production later in the year.

An important compromise has also been reached by which ownership of the Rochling steel works at Volklingen in the Saar is to be equally shared by the French and German Governments. The output of these works last year amounted to 880,000 tons of crude steel and employment is found for 14,000 men. Ultimate disposal to private interests is intended and this transaction will be handled by a consortium headed by Herr Aba, the German banker.

Progress in Flaw Detection

Modern methods of non-destructive testing are contributing to the high standard of mining safety and efficiency, both on the surface and underground, by revealing small internal defects in components and assemblies, which might have serious consequences if undiscovered. The use of portable equipment enables inspections to be made on site without dismantling machinery and plant, a facility which is particularly valuable underground, where it permits of a standard of maintenance which would otherwise be physically impossible. The following article describes current developments in the methods and equipment used in flaw detection.

In the flaw detection method, defective material is magnetized so that the line of flaw traverses a magnetic field. The crack, even if too small to be visible, becomes the gap in a magnet of very large mass and its edges the poles. When a finely ground iron powder, evenly suspended in a light oil such as paraffin, is sprayed or poured over the magnetized surface in the region of the flaw, fine particles of iron gather along the line of the flaw in a black cluster which is easily seen. It is usual to magnetize in two directions at right angles to each other. This method is also capable of detecting certain types of flaws just below the surface, which do not actually break through and create a gap.

Most of the magnetic detectors so far developed are intended primarily for permanent installation in works test departments. Though valuable tools for many purposes, they cannot be taken to the job. This limitation has been overcome by an instrument developed by R. P. R. Patents Ltd., and originally described in *The Mining Journal* of August 21, 1953. Known as the Minchom Sempun detector, it measures approximately 7 in. x 5 in. x 1½ in. and weighs only 6 lb. Being fully portable, it can readily be taken to any point on the surface or underground.

The chief problem in magnetic flaw detection is to magnetize correctly and strongly enough to obtain all flaw indications. Little, if any, reliance can be placed on the assumption that material which has been energized in a magnetic field will retain its magnetism when removed from the magnetic influence. Mild steel does not retain its magnetism, nor do many other steels. On the other hand, rings mounted on rods, or steel rods which are magnetized by passing a direct current through them from end to end, do retain their magnetic strength. The magnetic field takes the form of closed circles in these rings or in the steel rods, which remain effective for a long time. This requires a source of supply not generally available in *in situ* testing.

A NEW DETECTOR

In the Minchom Sempun detector this problem has been effectively solved by an ingenious combination of permanent magnets and a patented system of applying the magnetic force gradually to any shape of surface.

This instrument consists of two self-setting magnetic pole shoe brushes, two side links, and a central magnet link enclosed in a coil which forms the carrying handle. These parts are connected by ball and socket joints, so designed that the pole shoes may be presented to the test-work at any angle over a maximum span of 12 in. In order that full contact may be obtained between the shoes and the

work-face, each shoe has been provided with 45 contact pins which move automatically and independently of one another. The magnetic circuit, when not used for testing, is completed by a keeper bridge link.

METHOD OF OPERATION

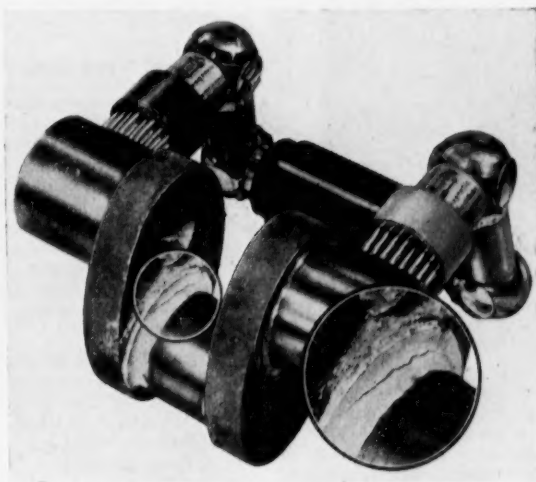
Each ball link is made up of three sets of laminations, one of which is non-magnetic. When a ball is turned so that the non-magnetic material is brought into contact with the socket, the magnetic effect between the poles is weakened by the equivalent of an air gap. By turning one or more balls so that the non-magnetic discs lie across the path of the magnetic forces, the strength of the instrument can be varied from 350 Oersteds across a 2 in. air gap down to less than 200 Oersteds. The upper limit can be increased by detaching the side links and connecting the brushes direct to the central magnet unit.

The strength of the detector is checked by means of a length of flat mild steel bar, which serves as a test piece. Surface flaws are simulated by four holes, drilled, plugged and burred over to "hide" them. Near surface flaws are simulated by other small holes drilled at different depths from the sides to central clearance holes. On one surface the flaws are further concealed by a thick coat of white enamel. The detector is applied to the test piece in such a manner that the pins of the brushes make contact with either end. Detecting ink is then sprayed on the white enamel surface. If the flaws are clearly defined, the instrument is in working order. The instrument can detect flaws within 1/16 in. below the surface. An accessory unit is available which almost trebles the clearness of indications obtained in the ordinary way when used in conjunction with the basic detector. When both units are applied in parallel on the same side of a plate, even deeply seated flaws can be brought out.

An important application from the standpoint of mine safety is in the examination of welded steel chain links. In steel chain material ½ in. dia., welded in the centre, a cavity ¼ in. dia. and ½ in. long centrally disposed below the surface can be clearly revealed.

To re-magnetize the detector, it is only necessary to connect the coil through one of the leads to the negative pole of a twelve volt car battery and then bring the other lead into momentary contact with the positive pole. Many hundreds of tests can be carried out before remagnetizing is required.

Orders and enquiries for this convenient and inexpensive instrument have been received from mining companies in all parts of the world.



The Minchom Sempun magnetic flaw detector

MACHINERY AND EQUIPMENT

A Fast Mobile Excavator

The Staffa-Bruneri hydraulic mobile excavator manufactured by Chamberlain Industries Ltd., is claimed to be a versatile unit providing high output with low running costs. The manufacturers state that in an hour, using standard bucket, the machine will excavate 40-55 cu. yd. or trench 25-35 cu. yd. or load 65-85 cu. yd. Compact design enables the Staffa-Bruneri to manoeuvre in confined spaces.



The Staffa-Bruneri Excavator

The Staffa-Bruneri is suitably powered by a diesel engine, coupled to a Plessey hydraulic pump. It is mounted on Austin Articulated or various other types of chassis, or in certain circumstances the unit can be fitted to the customer's own chassis of an approved type.

Maximum height of discharge is 14ft., maximum excavating depth with bucket 3ft., maximum excavating depth with trencher 6ft., standard bucket capacity 10 cu. ft., with continuous and complete slewing clockwise and anti-clockwise to 360 deg. Maximum radius for excavating is 14ft. 9in. and for trenching 16ft. 5in. The complete cycle of operation, i.e., loading, lifting, slewing and discharge, takes 30 sec.

Heavy Ropes Exported to Peru

British Ropes Limited of Doncaster, have just exported two eight-mile-long steel ropes to be used by a Peruvian mining organization. These unusually long ropes are to be used as haulage members on an aerial ropeway running from a mine 16,383 ft. up in the Andes, and reaching a height of 16,972 ft. on its course to a concentrator some distance away. The longest single span of the ropeway is nearly three-quarters of a mile.

The ropes themselves are unique in that they are the heaviest to be delivered in one length to Peru. Difficulties have had to be overcome, not only in loading and weight distribution on board ship, but in transport on the Central Railway of Peru. Special heavy wagons have had to be sanctioned for use on this railway, for the normal rolling stock is unable to carry such concentrated loads. These heavy wagons have been sent down to Callao from the private railway of the mining company.

Development in East Africa

Hunting Aerosurveys Ltd., a member of what is claimed as the only sterling area aerial group completely equipped to carry out all types of aerial survey and airborne geophysical work, has won the 1955 contract for air photography over a large area embracing parts of Tanganyika, Kenya, Uganda and Nyasaland. The contract was granted by the Crown Agents as part of the mapping programme being carried out by the Directorate of Colonial Surveys.

Three Hunting aircraft will be used on the contract, which embraces areas of widely varied interests, namely the Kilombero Valley and the lower region of the Rufiji river in Tanganyika

as well as the Entebbe region of Uganda. These are agricultural areas. Of particular interest, however, is the survey of the Ruwenzori mountains, also in Uganda, which have a high potential mineral wealth. The aircraft were to start operations in May.

Amongst the latest Hunting contracts are air photography in Germany, a mapping contract in Iraq, and mapping in Tanganyika in connection with ambitious hydro-electric power schemes designed to meet the growing demand in the Territory.

The Hunting Group has announced the formation of a company, to carry out airborne geophysical surveys in Australia. This Company has been formed by Adastra Airways Pty. Limited of Mascot, New South Wales, and Hunting Geophysics Limited of London. The company is called Adastra Hunting Geophysics Ltd. Adastra Hunting is the first airborne geophysical company to operate in Australia, and it has already started a comprehensive aeromagnetic survey for the Department of Mines, South Australia.

A Range of Water Meters

A new range of water meters known as the Master range has been developed by George Kent Ltd. as a successor to the company's MT range. The "Master" meter, in 1½, 2, 3 and 4-in. sizes (40, 50, 75, 100 mm.), is a pipe-line semi-positive rotary-piston meter which embodies many improvements from recent research and experience gained from over a million rotary-piston meters in service throughout the world. The range has been designed and developed to meet the accurate measurement of water flow at temperatures not exceeding 120 deg. F. It is logically anticipated that the Master will follow the MT to many of the world's mining fields in both surface and underground application.

The meter is built up of five main components: the outer casing or body, the measuring chamber, the under- or reducing gear, the counter, and the counter box. Arrows on the cover and on the side of the body indicate the correct direction of flow through the meter, and a pointer is provided for the indication of small quantities.



The Master Meter

The 1½, 2 and 3 in. sizes have a maximum counter registration of 10,000,000 Imperial gallons, while the 4-in. has a maximum of 100,000,000 Imperial gallons. Meters can be calibrated in Imperial gallons, litres, cu. ft., or any other desired units.

Statistics of performance show that the 1½ in. model commences to register at 3 g.p.h., the 2 in. at 4 g.p.h., the 3 in. at 8 g.p.h. and the 4 in. at 15 g.p.h. Accuracy within 2 per cent is achieved at 24 g.p.h. on the 1½ in. unit, ranging up to 100 g.p.h. in the 4 in.

METALS, MINERALS AND ALLOYS

COPPER.—In contrast to the London copper market which, as our Metal Exchange correspondent reports this week, may be easing somewhat, the position for prompt metal in New York remains exceedingly tight, with bids by dealers reported as high as 42 c. The fact that U.S. copper consumption fell during April to the lowest point since the close of last year is of little significance in view of the fact that unfilled orders on fabricators' books rose steeply, i.e. the copper wasn't there. Copper for June shipment is already reported virtually sold out and orders are now being booked for July. It is believed that mines and smelters will endeavour to avoid holiday shut-downs this year by staggering vacation periods, but even so some production is bound to be lost during the holiday season. Another indication of the tight copper position is to be seen in the stiffening of the scrap copper price. Smelters have been paying as high as 33 c. per lb. for No. 2 heavy copper and wire.

Indications that this state of affairs may well continue for some little time may be seen both in last week's announcement that Chile's exportable copper has already been sold out for this year, and also in the decision reported here last week that the O.D.M. would allow its third quarter stockpile deliveries to be diverted to industrial consumption.

All this cannot be making any easier the efforts of the Rhodesian Selection Trust Group to introduce their fixed price contract scheme. The present disparity between L.M.E. prices and the £280/£286 basis, on which R.S.T. are at present pricing their sales, must be causing a considerable headache to fabricators. The majority of these are members of trade associations pledged to maintain fixed minimum prices, yet, reasonably enough, R.S.T. have stipulated that the benefit of any price concession that they make should be passed on by the fabricator to the ultimate user. It is believed that somewhere between a third and a quarter of virgin copper consumption in this country originates from the R.S.T. group which means that a large number of users cannot be getting the benefit of the R.S.T. price at all while many more are benefiting only in part.

Presumably the fabricators could work out some kind of pooling arrangement whereby an average monthly price for all copper deliveries was worked out and compensation paid to the high price purchasers out of the gains of the lucky few, but it would clearly not be worth the industry's while to introduce this cumbersome procedure unless there was some certainty that the R.S.T. scheme would prove permanent. On this point it has been suggested in some trade circles that unless about three quarters of all the U.K.'s virgin copper were to be made available on a fixed price basis the scheme is unlikely to succeed. If this is a correct assessment, the outlook for the scheme must be rated as poor.

The disagreement between the Copperbelt mining companies and the African Mineworkers' Union over the recognition of the Mines' African Staff Association, came to a head earlier this month with the companies serving six months' notice on the African Mineworkers' Union of their intention to terminate their recognition agreement with that Union. The Chamber of Mines' statement announcing this made it clear that it was the Chamber's hope that a basis for agreement would be reached in the interim.

This dispute illustrates once again the inevitable growing pains which must accompany the industrialization of backward areas. In this instance, the Mines' African Staff Association, which was formed some two years ago, represents a logical outcome of the promotion of native workers to more responsible positions including such posts as boss boys, clerks, interpreters and mine police. In its early stages the Union had no company recognition but when official recognition was granted by the Chamber some two months ago the latter gave notice at the same time of their desire to negotiate a new agreement with the African Mineworkers' Union to enable their recognition of the new Staff Association to be effectively implemented.

The opposition of the Mineworkers' Union seems to be taking the form of dispute over demarcation on the grounds that a number of African mine employees who might suitably have joined the Staff Association are in fact remaining with the Mineworkers' Union. Opposition of this sort is clearly shortsighted and it can only be hoped that the inevitably divergent interests of staff employees will become manifest to the mineworkers before the dispute develops into anything worse. They should count it a considerable point gained that, with the encouragement of their employees, their staff colleagues are showing a readiness to embrace unionization which has taken generations

to achieve in many another more industrially advanced country.

It was recently announced in Salisbury by the chairman of the company that Magundi Copper Mines and Minerals had secured an interest in some Northern Rhodesian copper deposits. Ore discoveries in the area concerned are reported to have amounted so far to about 158,090 tons averaging 4 per cent copper. If this concern gets into production in Northern Rhodesia it will be the first small concern, independent of the large groups, to do so.

LEAD AND ZINC.—In a speech at Desloge last week, Mr. Andrew Fletcher, president of St. Joseph Lead, forecast that U.S. consumption of lead and zinc should this year run well above 1954 levels in view of the high level of activity in the steel and motor industries, which he expects to run about 10 to 13 per cent better than 1954.

In Washington the House of Representatives has passed and sent to the Senate a Bill extending until June 30, 1956, the duty-free import of all types of metal scrap other than lead and zinc scrap. Meanwhile, imports of refined lead into the U.S. during the first three months of this year dropped to 44,140 tons from 51,802 tons in the corresponding period of 1954. In the case of zinc, total imports in all forms for the first quarter of the year were virtually unchanged over a year ago at 147,881 tons.

The American lead market has shown no particular activity during the past week; probably due to the fact that there was considerable stocking up last month in anticipation of a possible further price increase. The zinc market, on the other hand, has been consistently strong at 12 c. East St. Louis, in the expectation that prices will rise another ½ c. in the event of an early settlement of the strike threat in the motor industry.

TIN.—The continuance in operation of the Texas smelter for another year now seems virtually assured. The Senate has given its O.K. and the House of Representatives is expected shortly to follow suit. Meanwhile, it has been confirmed from Washington that negotiations are already underway for further shipments of concentrates from Bolivia and, presumably, also from Indonesia.

In commenting last week on the Texas smelter report from the Senate Committees on Armed Services and banking and currency (*M.J.*, page 557) we suggested that the report had given undue emphasis to the political importance of the Bolivian tin industry, in view of the fact that, quite irrespective of tin, Bolivia seems assured of all the dollar aid she was likely to need. Confirmation of this view has since reached us in the report of a session of the Senate Foreign Relations Committee at which Mr. Edward J. Sparks, Deputy Assistant Secretary for Latin Affairs, is reported to have stated that Communist pressure on Bolivia, fomented in great measure by the 1953 decline in tin prices, could to a large extent be countered by United States aid. Mr. Sparks said that his department regarded the continuation of the foreign aid programme as essential to Bolivia and that already the programme had been of great assistance in maintaining the economic stability of the country. In the financial year starting July 1 next Bolivia was scheduled to receive \$16,000,000 out of the \$21,000,000 of development assistance funds earmarked for the Latin American section of the programme.

We have previously had occasion to note in these columns the development of the Billiton Tin Company's policy of extending its interests beyond Indonesia in the face of increasing nationalization in that country. Billiton have, of course, been acting as managers of the Texas smelter right along but among some of the more interesting recent developments in the company's activities include the strengthening of its position in Tanganyika where it has undertaken considerable exploration. It has also obtained a majority interest in the Kamativi Tin Mines in Southern Rhodesia where production has now begun and it also has an option on a controlling interest in a mining company in French Morocco. Billiton already has some 75,000,000 guilders invested outside Indonesia and is stated to have another 60,000,000 guilders available for further investment.

Representatives of the Alaska tin industry have urged that a government incentive programme be established to help the development of Alaska tin deposits. They claim that a \$1.25 per lb. floor would be sufficient for the industry. A House Interior Sub-Committee is holding hearings to determine what legislation should be considered.

ALUMINIUM.—In the next ten days the U.S. Government may announce how much aluminium it will call-in for delivery to the national stockpile during the September quarter of this year. Mr. Arthur Fleming, Defence Mobilizer, said earlier this week that the Business and Defense Services Administration was now studying recommendations that the U.S. Government cut-back its aluminium requirements in the July-August-September period of this year and that this subject would be discussed at top levels during the next week. The present shortage of aluminium in the U.S. makes this decision necessary and it did not come as a surprise that Mr. Fleming also said that the DMB would take up the question of whether or not a new aluminium expansion programme should be introduced in about one month's time.

COLUMBIUM/TANTALUM. Last week's announcement by G.S.A. that it would cease buying columbium/tantalum ore for stockpiling purposes in the United States has not affected plans previously made by the principal Canadian producers of the ores. Mr. D. D. Thomson, president of Beaucauge Mines, an associate company of Inspiration Mining and Development, said that construction of the company's projected pilot plant will be proceeded with as scheduled. The mill is expected to be in operation by August next.

MAGNESIUM.—What could prove to be an important additional market outlet for magnesium is seen in the announcement at the end of last week from Detroit where Magline Inc. of Pinconning, Michigan, has introduced a new all magnesium 4-wheel platform truck for general materials handling purposes. This is believed to be the first unit of its kind to be mass-produced of magnesium and the advantages of magnesium lightness and strength is reflected in the manufacturers' statement that the new truck is offered in ten different models each of which weighs only 25 to 33 per cent as much as comparable equipment of a similar size.

NICKEL.—To relieve the current shortage of nickel in the U.S.A., see this column May 13—the Office of Defense Mobilization has announced from Washington that an additional 2,000,000 lb. of market price nickel would be made available to U.S. industry during June. ODM said that this would be effected by diverting nickel destined for the national stockpile to industry. However, it was made clear that no nickel was being released from the stockpile.

TITANIUM.—The Deutsche Edelstahlwerke AG, of Krefeld, has commenced producing titanium thus becoming the second West German company to do so, the first being Krupp. This announcement was foreshadowed by the company's exhibition at the Chemical Fair in Frankfurt of titanium sheets, rods, wires, and castings.

The G.S.A. has announced the award of two experimental contracts to produce titanium. One contract, with the National Research Corporation and the Monsanto Chemical Company, would test a new fused salt process for production in a pilot factory with a capacity of 1,000 lb. of titanium daily. Under the second contract, with Horizons Inc., of Cleveland, Ohio, the company would regenerate titanium from impure scrap metal using its own patented process. Almost all of the titanium production in the U.S. is allocated to defence needs but with output increasing, G.S.A. and the Commerce Department are sponsoring the metal's use in the production of civilian products.

URANIUM.—The preliminary estimate by the South African Department of Excise and Customs has placed the value of exports of prescribed materials (uranium and thorium) under the Atomic Energy Act in March at £2,159,150 against £2,235,700 in February. The March figure brings the total for the first three months of 1955 to £5,879,106 against £2,189,737 in the corresponding period of the previous year. Exports of these materials in March, 1954, totalled £530,858.

The London Metal Market

(From Our Metal Exchange Correspondent)

Activity on the Exchange has been slightly greater this week with a firm undertone for lead and zinc and with the copper price still moving erratically. This state of affairs is due to a steady demand for the first two metals, whereas for the last there seems to be no unanimity of ideas about the immediate price trend.

The technical position of the copper market is also such that in spite of a slight increase in the stocks reported on Monday there is still a short nearby position, although this shows signs of easing, and if this proves to be the case the present unhealthy

backwardation should be appreciably diminished with beneficial results to the general functioning of the market.

The tenders for the Government copper had to be in on May 24, and it is hoped that the results will be available on May 27, but opinion still is that the market itself will not be affected to any extent.

The tin market has shown no special feature this week but the undertone seems to be quite good and price movements have been small. The House Banking and Currency Committee has passed a resolution in Washington to continue the operation of the Texas City smelter until the end of June, 1956, and it is expected that this will also pass the House of Representatives. Fears of a possible surplus of supplies have been allayed as it is probable that the U.S. Government's short-term contracts for Indonesian and Bolivian concentrates will be extended to June of next year.

News about the International Tin Agreement is lacking, but it is thought that a sufficient number of countries will ratify and that the Agreement will eventually become operative. We understand from correspondents in the Argentine that I.A.P.I. have bought about 1,900 tons of tin since the beginning of this month. On Thursday morning the Eastern price was equivalent to £733½ per ton c.i.f. Europe.

Closing prices and turnovers are given in the following table:—

	May 19		May 26	
	Buyers	Sellers	Buyers	Sellers
Copper				
Cash	£334½	£335	£330	£331
Three months	£314½	£315	£317	£317½
Settlement	£335		£331	
Week's turnover	3,300 tons		5,175 tons	
Tin				
Cash	£714	£714½	£715½	£716
Three months	£716½	£717	£717½	£718
Settlement	£714½		£716	
Week's turnover	465 tons		495 tons	
Lead				
Current half month	£103	£103½	£103½	£103½
Three months	£102½	£102½	£102½	£103
Week's turnover	2,675 tons		2,475 tons	
Zinc				
Current half month	£89½	£90	£90½	£91
Three months	£88½	£88½	£88½	£89½
Week's turnover	2,925 tons		4,250 tons	

OTHER LONDON PRICES — MAY 26

METALS

Aluminium, 99.5%, £163 per ton	Magnesium, 2s. 4d. lb.
Antimony—	Nickel, 99.5% (home trade)
English (99%) delivered, 10	£519 per ton
cwt. and over £210 per ton	Osmium, £30 oz. nom.
Crude (70%) £200 per ton	Osmiridium, £40 oz. nom.
Ore (60% basis) 22s./24s. nom.	Palladium, £6 12s. 6d./£7 5s. oz.
per unit, c.i.f.	Platinum, £27 10s./£29
Bismuth	Rhodium, £40
(min. 2 cwt. lots) 16s. lb.	Ruthenium, £16 oz.
Cadmium (Empire) nominal	Quicksilver, £108
Chromium, 6s. 5d./7s. lb.	ex-warehouse
Cobalt, 21s. lb.	Selenium, 43s. nom.
Gold, 250s. 11d.	per lb.
Iridium, £30 oz. nom.	Silver, 78½d. f.o.z. spot and
Manganese Metal (96%-98%)	78½d. f'd
£255/£265 according to	Tellurium, 15s./16s. lb.
quantity	

ORES, ALLOYS, ETC.

Bismuth	60% 8s. 3d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semi-	
friable) 48% ..	£13 per ton c.i.f.
Refractory 45% ..	£13 per ton c.i.f.
Smalls 42% ..	£10 2s. 6d. per ton c.i.f.
Magnesite, ground calcined ..	£26-£27 d/d
Magnesite, Raw ..	£10-£11 d/d
Molybdenite (85% basis) ..	105s. 3d.-108s. 1d. per unit c.i.f.
Wolfram and Scheelite (65%) ..	245s./250s. c.i.f.
Tungsten Metal Powder ..	19s. 0d. nom. per lb. (home)
(98% Min. W.)	
Ferro-tungsten (80%-85%) ..	16s. 0d. nom. per lb. (home)
Carbide, 4-cwt. lots ..	£37 6s. 3d. d/d per ton
Ferro-manganese, home ..	£53 17s. 6d. per ton
Manganese Ore Indian c.i.f.	
Europe (46%-48%) ..	79d./80d. per unit
Manganese Ore (38%-40%) ..	67d./69d. per unit
Brass Wire ..	3s. 2d. per lb. basis
Brass Tubes, solid drawn ..	2s. 6½d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets although dominated by the general election, remained firm during the past week, due principally to hopes of the re-election of a Conservative Government. This brought about a recovery in the price of sterling abroad and strong American buying of British industrial shares mainly with security sterling.

Business in Kaffirs remained at a low level despite some improvement in the Johannesburg market. The constitutional crisis in South Africa is undoubtedly viewed with distrust by overseas investors, and buyers in London were almost non-existent. Despite this factor, price changes were generally small although Johannesburg Consolidated were a weak spot following the Randfontein report.

Among individual Rand mines, similar conditions prevailed. Price changes were generally irregular and no definite trend was revealed. The statement by the Randfontein chairman at the meeting caused a sharp drop in the share price. It is still uncertain to what extent increased uranium profits will offset losses on gold. In this connection, Dominion Reefs, another potential uranium producer, dropped back.

In the Orange Free State, an outstanding feature was Free State Geduld. Strong rumours that good development results would be announced caused the shares to surge ahead as high as 97s., but later a reaction set in although the stock finished higher on balance. The actual results revealed good underground reef development although widths were narrow. The lessening probability of further flotations of new properties led to a fall in Geoffries. Elsewhere prices remained virtually unchanged, steadiness being particularly noticeable in Western Holdings, St. Helena and President mines.

There was little more interest in West Africans. The lower profits for the March quarter had little effect upon the Western Selection group and Ariston gained the turn on renewed interest being shown in the medium term prospects of the mine after publication of a market circular.

Diamond issues again came to the fore although there were few major changes. The strong investment position of Anglo

American Investment Trust and De Beers caused some interest in the shares although price changes were small. The substantial increase in reserves shown by the Consolidated Diamonds of South West Africa impressed the market although rather restricted dealings left the shares unchanged.

Coppers were generally a very good feature, the improvement following the higher metal price. Most of the leading stocks went ahead strongly, Chartered and Selection Trust being particularly favoured. Strong buying from Paris caused a sharp jump in Rio Tinto. Discussions regarding increased responsibilities for African labour have been opened by a memorandum from the union to the mine management.

Considerably more interest was displayed in Eastern tin shares. Recently there has been a considerable number of articles in the financial press drawing attention to the metal market situation and to the reserves and life of certain leading companies. Ayer Hitam was an outstanding feature following the announcement that the company is buying a second dredge which will be installed on the property in Malaya. Gopeng, a leading mine operated by the hydraulic system, also received favourable comment. Improvement occurred in other mines such as Tronoh and Malayan Dredging. Increased interest was widespread throughout this market.

Nigerians were less fortunate. The recent announcement of America's intention not to renew the columbite contract still overshadowed dealings here despite the fact that few people had expected these to be renewed beyond their present life. It is thought that columbite should be well able to hold its own in world markets after the expiration of the agreement despite the challenge by titanium.

Lead/zinc shares were rather mixed. There was some profit taking after recent advances but Rhodesian Broken Hill and San Francisco mines were two strong features. The price of silver has remained steady at the higher level.

Canadian mines were generally harder following the steady base metal prices and the slightly better trend on Wall Street.

FINANCE			Price	+ or -	RAND GOLD contd.			Price	+ or -	DIAMONDS & PLATINUM			Price	+ or -	TIN (Nigerian and Miscellaneous)			Price	+ or -
			May 25	on week				May 25	on week				May 25	on week				May 25	on week
Anglo American Corp.			34	+	W. Rand Consolidated.			42/6	-7 1/2d	Anglo American Inv.			8 1/2	-9d	Miscellaneous contd.			1/3	-3d
Anglo-French			20/9	-6d	Western Reefs			41/3	-7 1/2d	Casta			24/9	-9d	Gold & Base Metal ..			1/3	-3d
Anglo Transvaal Consol.			26/3	+7 1/2d	O.F.S. GOLD					Cons. Diam. of S.W.A.			6	+	Jantar Nigeria			13/9	-3d
Central Mining (El shrs.)			39/9	-9d	Freddies			4/-	-3d	De Beers Delf. Bearer			7 1/2	+	Jos Tin Area			13/9	-3d
Consolidated Goldfields			60/-	-7 1/2d	Freddies Consolidated			5/9	6d	De Beers Pld. Bearer			15 1/2	+	Kaduna Prospectors			2/4	-
Consol. Mines Selection			36/10 1/2	-10 1/2d	F.S. Geduld			4 1/2	+	Pots Platinum			8/-	-3d	Kaduna Syndicate			2/4	-
East Rand Consols			2/4 1/2	-	G.F. Gies			16/6	9d	Waterfall			14/4 1/2	-	London Tin			7/6	-9d
General Mining			4 1/2	-	Harmony			33/6	6d	COPPER					United Tin			2/3	-3d
H.E. Prop.			10/-	-	Lorraine			10/3	-1 1/2d	Bancroft			40/3	+3d	SILVER, LEAD, ZINC				
Johnnies			36/-	-1 1/3	Lydenburg Estates			20/7 1/2	+7 1/2d	Chartered			57/6	+1 1/2	Broken Hill South			52/3	-3d
Rand Mines			34	-	Merriespruit			10/9	-6d	Esperanza			4/6	-	Buma Corporation			2/7 1/2	-4d
Rand Selection			41/3	-3d	Middle Wits			16/3	-6d	Messina			7 1/2	+	Consol. Zinc			47/9	-9d
Union Corporation			38/-	-3d	Ofsits			3 1/2	-	Nobanga			13 1/2	+	Lake George			12/10 1/2	-4d
Vereniging Estates			4/-	-	President Brand			70/7 1/2	+7 1/2d	Rhod. Anglo-American			97/6	+3d	Mount Isa			51/6XSD	-1/3
Wits			41/10 1/2	-3d	President Steyn			29/-	-	Rhod. Katanga			18/10 1/2	-7 1/2d	New Broken Hill			36/3SD	-1 1/2
West Wits			39/9	-3d	St. Helena			37/1	-	Rhodesian Selection			35/9	-	North Broken Hill			73/6	-
					Virginia Ord.			13/9	-6d	Rhosana			35/9	-	Rhodesian Broken Hill			12/3	-1 1/2
					Welkom			21/6	-6d	Rio Tinto			58 1/2	+3d	San Francisco Mines			23/9	+1/3
					Western Holdings			4 1/2	-	Roan Antelope			26/10 1/2	+1 1/2	Uruswa			6/7 1/2	+ 1/2
										Selection Trust			73/3	+3/3					
										Tanks			6 1/2	+					
										Thariss Sulphur Br.			7 1/2	+					

COMPANY NEWS AND VIEWS

F.S. Geduld Features Prominently in Anglo Progress Reports

Following the recent publication of reports and accounts in respect of Anglo American Group Orange Free State companies, the eagerly awaited meetings of these companies have since taken place at Johannesburg. Although the spark needed to touch off a burst of buying in O.F.S. issues was not forthcoming, its lack is inherent in the prevailing market conditions rather than in the results announced. Details of development work since the end of the first quarter of the present year up to May 25 now announced have shown steady progress.

In the case of Free State Geduld a discovery of considerable importance was made. At this property a borehole put down from the No. 47 haulage south at the No. 1 shaft intersected the reef at 141 ft. below the haulage horizon and the core recovered gave a value of 1,615.3 dwt. over 4 in., equivalent to 6,461 in. dwt. This disclosure is of particular significance firstly, due to its occurrence in the No. 1 shaft area where values had not hitherto been regarded as exceptionally rich. And secondly the borehole's position was 1,000 ft. east of the Mijannie No. 1 hole from which only 1,747 in. dwt. were originally obtained. On the other hand to place undue emphasis on this excellent value would at the present time undoubtedly be premature. All that can be said with confidence—before further underground development is carried out in the area—is that prospects for the western part of the property have been improved.

Since the end of March, further development has taken place in the haulage extending into the Free State Geduld property from Western Holdings. This yielded values equal to 1,787 in. dwt. from a total of 115 ft. sampled, all of which was payable, and compares with 1,665 in. dwt. together with the same total payability during the first three months of the present year. At No. 2 shaft, reef development had been previously carried out on two levels only—Nos. 51 and 49. Last week the crosscut west of No. 47 level cut the reef 1,400 ft. west of the shaft. The 20 ft. sampled averaged 268.7 dwt. over 7 in., equal to 1,881 in. dwt. All of this footage was payable. In addition, it is hoped that the reef will be picked up shortly on Nos. 45 and 43 levels from the No. 2 shaft. Total development, excluding that on the above-mentioned 47th level, since March 31 revealed 96 per cent payability as against 90 per cent in the first quarter. Values rose to 714 in. dwt. from 703.

A question put to the chairman regarding the date on which production might start elicited the statement that it was hoped to commence crushing before the end of the year.

Amongst other development results achieved during the period March 31 up to May 25, details in respect of President Brand were good. Payability rose to 91 per cent from 90 per cent and values amounted to 975 in. dwt. as against 1,227 in. dwt. during the first quarter. At Western Holdings payability was 88 per cent as compared with 86 per cent, while values declined to 722 in. dwt. from 778 in. dwt. President Steyn reported payability up 1 per cent to 96 per cent, but values down to 591 in. dwt. from 632. At Welkom payability fell to 70 per cent from 78 per cent, and values also declined to 399 in. dwt. from 442 in. dwt. Loraine also reported a drop in payability to 49 per cent from 77 per cent. Values were 268 in. dwt. as compared with 288. Production at this mine started at the beginning of May—operating results will be declared at the end of the current month.

Amits Increases Revenue and Pays More

A slight increase in earnings from investments to £2,752,749 from £2,622,335 was disclosed by the annual report of Anglo American Investment Trust for the year ended December 31, 1954. This improvement, together with a rise in income from interest and other sources to £33,206 from £20,692, brought total revenue earned up to a slightly higher level than that of the previous year.

Year to Dec. 31	Total* Revenue £(000)	Tax-ation £(000)	Net Profit £(000)	Divi- dends £(000)	To Reserve £(000)	Carry Forward £(000)
1954	2,785.9	26.6	2,731.6	1,875.0	750.0	639.5
1953	2,643.0	40.0	2,573.6	1,500.0	1,000.0	533.0

* From investments £2,752,749 (£2,622,335). Interest and other sources £33,206 (£20,692).

Dividends paid on the issued ordinary capital of £2,500,000 in shares of £1 each were raised to 75 per cent from 60 per cent in respect of the preceding 12 months. The extra 15 per cent was distributed in the form of a bonus.

During the past year quoted investments previously shown on the balance sheet at £10,863,832 were more than doubled at £22,425,653. As the company's main investment is its 20 per cent holding of the issued ordinary capital of De Beers Consolidated Mines, whose issued equity enjoyed so great a rise in value during 1954, it is not difficult to explain this sharp movement. Amongst the unquoted investments which are shown at cost of £4,773,157 are further interests in the diamond trade including a holding in Boart Products South Africa, a participation in the Diamond Corporation and shareholdings in several of the allied marketing organizations.

Reflecting its predominant interest in De Beers Consolidated Mines, Amits £1 ordinary shares stand at about £8 15s. to yield about 8½ per cent. The return at present obtainable on De Beers ordinary and deferred shares is 8½ per cent.

Sir E. Oppenheimer is chairman. Meeting, Johannesburg, June 14.

Selection Trust to Pay 7½ Per Cent More: Free 1 for 20 Issue

Favourable base metal prices together with a highly prosperous year for diamonds are amply reflected in the Selection Trust accounts for the period ended March 31, 1955.

Year to Mar. 31	Total Revenue £(000)	Ex-penses £(000)	Tax-ation* £(000)	Net Profit £(000)	Divi- dends %	To Reserve £(000)
1955	2,204.1	69.2	1,032.8	1,102.1	50	400.0
1954	1,577.0	68.5	830.5	678.0	42½	100.0

* After deducting adjustments

With the recommendation of a final dividend amounting to 35 per cent on the issued ordinary capital of £2,242,399 in stock units of 10s., total distribution for the year has been raised to 50 per cent from 42½ per cent.

It is also announced that the company intends to distribute 1 new 10s. share in respect of every 20 units held. This will involve the capitalization of £112,119 10s. from share premium account.

At their present price of about 73s. 3d. the return obtainable on the 10s. units is about 6½ per cent. But in view of the smallness of the present proposed scrip issue, it will no doubt be generally expected that the 50 per cent dividend should be maintained on the new capital. In this event the indicated return would be somewhat higher. Mr. A. Chester Beatty, Jr., is chairman.

Rho. Broken Hill Produces Record Zinc Tonnage in Jubilee Year

A record tonnage of zinc at 26,550 tons as compared with 25,330 tons was produced by Rhodesia Broken Hill Development Company during the year ended December 31, 1954, which marked the 50th anniversary since its inception. Lead output amounted to 15,000 tons as against 11,510 tons during the previous year. These notable achievements, together with favourable lead and zinc prices resulted in a useful expansion of total revenue.

Year to Dec. 31	Total revenue Operating £	Other £	Tax-ation £	Net Profit £	Divi- dends £	Carry Forward* £
1954	1,489,973	76,107	452,000	1,024,883	812,500	215,220
1953	1,277,887	63,730	381,856	867,896	650,000	395,605

* After appropriation for capital expenditure of £392,768 (1953—£200,000)

Dividends on the issued ordinary capital of £3,250,000 in 5s. stock units were accordingly raised to 25 per cent from the previous figure of 20 per cent. Sir Ernest Oppenheimer is chairman. Meeting, Nkana, Northern Rhodesia, June 15.

Nickel Earns \$1.38 Per Share in First Quarter of 1955

It is announced by the International Nickel Company of Canada that during the first quarter of 1955 earnings per common share rose to \$1.38 from \$1.19 in the previous quarter. During the first quarter of 1954 earnings amounted to \$1.06. Group figures for the three months ended March 31, 1955, disclosed net earnings in terms of U.S. currency of \$20,678,248 after all charges, depreciation, depletion, taxes, etc. This compared with net earnings for the December quarter of \$17,864,625. During the first quarter of 1954 net earnings were \$16,046,937. Dr. John F. Thompson is chairman.

Aluminium's Higher Earnings in First Quarter of 1955

An increase of 22 per cent in sales and operating revenues from \$75,130,125 in the first quarter of 1954 to \$91,890,903 for the period ended March 31, 1955, is disclosed by a consolidated earnings statement published by Aluminium Ltd. Net income during the three months moved up from \$6,787,939 to \$9,053,394, an advance of 33 per cent.

P. Steyn's New Issue Not Expected Until July

At the meeting of President Steyn Gold Mining Company, it was disclosed that the foreshadowed new issue of shares is not expected to take place until early in July. This is due to options held by the Anglo American Corporation to take up 1,840,000 shares at 20s. being outstanding until the end of June. In these circumstances the number of shares to be issued and their price cannot as yet be decided. It was felt, however, that a sum in the region of £2,000,000-£2,500,000 should be raised.

Central Provinces Manganese Ore's Decreased Profits

Due to an appreciably lower price obtained for their products, revenue earned by the Central Provinces Manganese Ore company during the year ended December 31, 1954, suffered a considerable setback. In addition, raiting difficulties prevented contracts being implemented in full.

Year to Dec. 31	Total Revenue	Tax- ation	Net Profit	Divi- dends	To Reserve	Carry* Forward
	£	£	£	£	£	£
1954	2,291,669	1,265,000	899,284	625,000	225,000	228,790
1953	3,353,522	2,200,000	1,057,651	700,000	275,000	232,294

* After Staff Benefits contributions of £52,788 (£42,961)

Dividends of 41½ per cent, tax free, were paid on the issued ordinary capital of £1,500,000 in units of 10s. This compared with 70 per cent for the previous year before the capital was increased to its present level by a 50 per cent free scrip issue.

Burma Corporation Makes Profit: Pays Dividend

A sharp increase in productivity was achieved by Burma Corporation (1951) during the year ended June 30, 1954. This very satisfactory progress was due to increases in the number and proficiency of mine labour. Ore milled rose to 83,990 tons from 38,284 tons previously and throughput of virtually all the company's marketable products showed marked advances. For the first time since the war all production was from newly mined ore, pre-war stocks and partly processed smelter products having been consumed earlier.

Year to June 30	Refined Lead	Refined Silver	Zinc Concs.	Copper Matte	Nickel Speiss	Antimonial Lead
	(tons)	(oz.)	(tons)	(tons)	(tons)	(tons)
1954	9,081	863,085	9,558	154	161	96
1953	3,740	405,914	5,000	65	171	166

This excellent progress brought total revenue earned up to a level more than double that of the preceding period.

Year to June 30	Total Revenue	Tax- ation	Net Profit	Divi- dend	To Reserve	Carry Forward
	£	£	£	£	£	£
1954	1,475,305	57,000	271,003	56,505	21,975	1,023
1953	669,441	Nil	Dr 198,348	Nil	Nil	Dr 191,500

A maiden dividend of 1½ per cent, free of Burma tax, was accordingly paid on the issued ordinary capital of £3,836,110 in "A" and "B" shares of K.10 (Burma Kyats).

Much highly skilled work remains to be done in reopening and rehabilitating further areas in the mine rendered inaccessible during the Japanese occupation. This work will become essential not only for maintaining current output but also to obtain the greater tonnage which would be required if the projected mill expansion—now under consideration—is introduced.

Results in respect of the second quarter of the current financial year up to December 31, 1954, revealed an operating profit of £186,292 as compared with £165,000 in respect of the preceding three months. Operating profits for the first six months of

the year have thereby been brought up to £351,292. After tax of £181,275, depreciation of £22,492 and capital expenditure of £44,280 the estimated net profit for this period was £145,525.

The above financial and technical details were included with the annual report and accounts of Burma Mines Ltd. for the year ended December 31, 1954. This company's principal asset is its holding of 3,159,730 fully paid "B" shares of K.10 each—or 50 per cent—in Burma Corporation (1951). The remaining half of the issued ordinary capital is owned by the Burma Government. As a result of the Burma Corporation's maiden dividend Burma Mines' accounts for the past financial year showed a profit of £35,379 after providing for taxation. The debit balance of £812 brought forward from the previous year was accordingly eliminated and the sum of £33,494 carried to the balance sheet.

In his statement to shareholders of Burma Mines Mr. John R. Govett, the chairman, stated that he saw no reason why the joint venture in Burma should not continue to develop its production and to achieve improving results. Referring to Burma Corporation's concentrating plant, however, he stated that as this installation had been working at full capacity for some months its scope for expansion is increasingly restricted. The provision of additional plant is, therefore, under active consideration and must be undertaken before further increases in tonnages mined can take place. Similarly, no substantial rise in the output of marketable products can immediately be possible.

Another factor affecting the future profitability of Burma Corporation stressed by Mr. Govett was that sales of pre-war zinc concentrates made a substantial contribution to the past year's results. When these stocks become exhausted—probably during the first half of 1956—operating profits will depend solely upon the sale of products from newly mined ore.

Mining Year Book, 1955

An essential constituent of any library concerned either directly or indirectly with mining, *The Mining Year Book*, compiled by Walter E. Skinner, has for long been a traditional source of information. The publication is now in its 69th year, and amongst the wealth of data contained in its pages, the most prominent section is that presenting detailed facts and statistics of nearly one thousand companies concerned with the mining industry.

The annual preface to the volume, in keeping with its predecessors, provides a review of activities of those companies active during the last year in both the financial sphere and that of technical mining operations. Interesting statistics are given in support of this commentary. The various maps included are always of significant value and in the present edition this service is extended to include Dominion Reefs, a company around which much attention has recently been centred.

The book is published by Walter E. Skinner, 20 Copthall Avenue, London, E.C.2, and the *Financial Times*, 72 Coleman Street, London, E.C.2; price 30s. net, 31s. 6d. post free inland and abroad.

Harmony G.M. to Pay 6 Per Cent on Registered Unsecured Convertible Notes.—It has been announced by the London Secretaries of Harmony Gold Mining Co. Ltd. that the Register of Noteholders will be closed from June 10 to 30, 1955, both days inclusive, and that cheques in payment of interest at the rate of 6 per cent p.a. for the period January 1 to June 30, 1955, will be posted to registered noteholders on or about June 30, 1955.

Anaconda: Chairman Retires; Old Name Expires.—It has been announced that Mr. Cornelius F. Helley, known as "Mr. Copper" throughout the copper industry, has retired as chairman of The Anaconda Copper Mining Company, a position which he has held for 15 years. No successor has been named.

The company has also announced that it will change its name to the Anaconda Company. This has been done because of its widening scope of operations and it is expected that the new name will come into effect on June 18. It will not involve any change in the company organization, capital stock, or rights of shareholders.

AGENCE MINIERE ET MARITIME S A

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METALLURGICAL GRADUATE, with considerable experience in ore dressing and flotation, is required for a Diamond Research Laboratory associated with the Corporation. The salary offered will be commensurate with experience. Applications, stating age, marital status, qualifications and experience, should be addressed to the Appointments Department, Anglo American Corporation of South Africa Limited, 11 Old Jewry, London, E.C.2.

THE RHODESIA BROKEN HILL DEVELOPMENT CO., LTD.

(Incorporated in Northern Rhodesia)

RECORD ZINC PRODUCTION

SIR ERNEST OPPENHEIMER'S REVIEW

The following are extracts from the Statement by the Chairman, **Sir Ernest Oppenheimer**, which has been circulated with the Report and Accounts for 1954.

The year under review, marking as it did the jubilee of the Company's foundation, is of more than ordinary interest. Fifty years ago, when the Company began operations, it was a pioneer faced by many obstacles in a primitive, undeveloped country; to-day the thriving town and community of Broken Hill are evidence of its achievements. These achievements are the results of a policy of courage and tenacity consistently pursued despite many reverses and difficulties. In 1954, zinc production achieved a new record and lead production was the highest since 1947. The fiftieth anniversary celebrations held on December 16 last year thus set the seal on a half century of courageous and successful endeavour.

We can now claim that the Company has reached a stage of relative stability and has many years of fruitful activity ahead of it.

During 1954 the London Metal Exchange prices for both lead and zinc were reasonably steady, with a general trend upwards, and the profit for the year shows a welcome increase of about 18 per cent. over that for 1953. True, lead production was still adversely affected by continuing difficulties in the operation of the new lead plant; but the consulting engineers are satisfied that it is inherently sound in design, although the operational problems, almost inevitable with any new plant, have been more troublesome than was anticipated.

The Directors in their report refer to changes made in the balance sheet to show the Company's capital and capital reserves more realistically in relation to expenditure on assets of a fixed nature. I should like to draw the attention of members to the significance of the figures now presented. These show that retained profits—which have been provided from earnings subject to taxation—are in excess of the total subscribed by way of share capital and share premium.

Another change will affect the future publication of metal production figures. In the past these have been issued monthly. Your Board feels that quarterly reports, by averaging output over periods of three months, will give a truer picture of activity than monthly ones, and also bring the Company's practice into line with that of other mining companies.

During the year African conditions of employment were further improved by the institution of a non-contributory pension scheme and a paid leave scheme. These benefits are in addition to the existing long service and retirement bonus payments made to African employees.

SUMMARY OF OPERATIONS

	1954	1953
FINANCE		
Operating profit	£1,489,973	£1,277,887
Taxation	£452,000	£381,856
Dividends—total	£812,500	£650,000
Dividends—per unit of stock, net ...	1s. 3d.	1s.
METAL PRODUCTION		
Tons of ore treated—short tons ...	135,886	141,649
Average grade—percentage of lead ...	19.2	18.0
percentage of zinc ...	28.7	29.1
Production—long tons: zinc	26,550	25,330
lead	15,000	11,510
ORE RESERVES		
Proved reserves	1,463,400	1,543,500
Indicated reserves	909,100	973,700
Total extractable reserves—short tons ...	2,372,500	2,517,200
Average grade—percentage of lead ...	17.3	17.2
percentage of zinc ...	26.0	26.7
Allocation of reserves:		
Extractable reserves—short tons:		
Oxide ore	914,800	1,009,700
Sulphide ore	1,457,700	1,507,500
Total	2,372,500	2,517,200
Broken ore in stopes underground—short tons	159,300	140,000
Surface stockpiles—oxide ore—short tons	237,000	254,000

Copies of the Report and Accounts can be obtained from the London Office of the Company, 11 Old Jewry, E.C.2.

TRANSVAAL CONSOLIDATED LAND AND EXPLORATION CO., LTD.

MR. T. REEKIE IN THE CHAIR

At the sixtieth Annual Meeting of shareholders held in Johannesburg on May 10, 1955, **Mr. T. Reekie**, the Chairman, in the course of his remarks said:—

The larger tonnage of coal despatched from the Van Dyks Drift Colliery resulted in the profit from this source increasing by £7,772 to £130,342. Revenue derived from mineral royalties rose by £25,049 to £125,884, due principally to higher receipts from the tributors of the Penge asbestos property, the chrome deposits on portions of the farms Doornbosch No. 423 and Winterveld No. 424 in the district of Lydenburg, and the Groenfontein tin mine. In contrast to a net expenditure of £62,100 on exploration and ventures in 1953, there was a credit in 1954 against Mineral Interests amounting to £44,488, the major part of which related to the recovery of the company's proportion of expenditure incurred by the Platinum Prospecting Association (now the Platinum Prospecting Company (Pty.) Ltd.) which in past years had been written off in our accounts. These and the other variations in the main items of income and expenditure account for the increase of £112,863 in the realized profit, before taxation, for 1954, which amounted to £350,818. After providing for taxation and the increased dividend of 2s. a share declared in December, 1954, the balance of the Income and Expenditure Account at the year-end stood at £557,129. At that date net current assets totalled £559,011 which compares with £367,855 a year earlier. The company's cash resources have been materially strengthened in recent years as the Board considers it to be in the interests of the company to retain adequate liquid funds to enable advantage to be taken of favourable opportunities for investment or for the exploitation of the company's mineral interests.

INCREASED RAIL CAPACITY

There was an increased though irregular supply of railway trucks to Van Dyks Drift Colliery during the year which, however, was inadequate to enable the colliery to achieve full production. Nevertheless, the position, particularly in the last quarter of the year, showed some improvement compared with the preceding year, which is reflected in the increase of over 43,000 tons in the coal despatched. Since the close of the financial year the Railways have made additional truckage available for coal transportation in order to improve supplies in the country, and your colliery's output has continued on an increased scale, for which it has adequate equipment and face room underground. The demand for coal in the Union continues to show a steady increase and the extent to which the coal industry will be able to satisfy this demand is mainly dependent on the degree of success that attends the considerable efforts which the Railways Administration is making to surmount its present difficulties. The coal export trade has declined to meagre proportions, mainly for bunkers, and until the demand of the domestic market can be satisfied, there seems little possibility of improvement in this business.

Development work at the Brakspruit property has been continued with satisfactory results and metallurgical work on the ore from the property has been carried out on a laboratory scale. This work by the Platinum Prospecting Company (Pty.) Ltd. is at present being financed by means of temporary loan facilities in which your company is participating.

The Chairman replied to a shareholder who raised various questions regarding the enforcement of the conditions of title in certain of the townships administered by the Company. In reply to a further question by the same shareholder as to whether the number of Directors should not be reduced to the minimum of three, the Chairman stated that the appointment of persons to the Board and its constitution was in the hands of the shareholders, and said in reply to another question that no useful purpose would be served by making a bonus issue of shares which would merely increase the issued share capital of the Company, and would incidentally attract tax in the hands of many shareholders.

In reply to another shareholder's question regarding the prospecting of the Brakspruit property, bearing in mind the state of the platinum market, the Chairman stated that the Platinum Prospecting Co. (Pty.) Ltd. was proceeding with the underground exploration of the property as expeditiously as possible. In reply to a further question from the same shareholder, he stated that as the Income Tax Act, 1955, had not yet been promulgated, he was unable to say to what extent the proposed undistributed profits tax would affect the Company.

The Report and Accounts were adopted.

THE CENTRAL MINING — RAND MINES GROUP

Extracts from Statements by Chairmen at Annual General Meetings in Johannesburg

DURBAN ROODEPOORT DEEP, LTD.

At the fifty-eighth Annual Meeting of shareholders held in Johannesburg on May 9, 1955, **Mr. N. W. S. Lewin**, the Chairman, in the course of his remarks said:—

Compared with the previous year, there are slight decreases in the tonnage milled, the yield per ton, and the average revenue per fine ounce of gold and, in consequence, total working revenue fell by £75,404 to £4,422,241. Working costs continued their upward movement and the result of these trends was that working profit decreased by £242,262 to £569,105. During the current year the mine has met with considerable difficulties due to a large inflow of water after the exceptionally heavy rains. These difficulties are being overcome but they naturally had an adverse effect on both costs and tonnage. Due to a greater tonnage milled and a slightly higher yield, the company was, nevertheless, able to maintain its monthly profits for the first four months of the year at approximately last year's average.

The footage sampled in 1954 was much the same as in the previous year, but the percentage payability decreased from 73.2 per cent. to 58.3 per cent. The inch-dwt. value, however, increased from 348 to 410. Included in the footage sampled was 1,050 ft. averaging 181 inch-dwt. over a channel width of 83 inches on the 48th level Main Reef in drives east and west from the haulage south from No. 6A Shaft. This drive is in the vicinity of the new lease area and the values indicate that it is in an unpayable zone.

The ore developed increased by 303,000 tons to 1,822,000 tons of an average value of 4.1 dwt. Slightly more than half of the tonnage developed was on the Main Reef and averaged 4.7 dwt. per ton, which is the highest value recorded on this Reef since 1946 when the value was 4.8 dwt. There was also a substantial increase in the tonnage opened up on the Kimberley Reef at an average value of 3.5 dwt., which is 0.3 dwt. below the figure for the previous year. As you know, the Kimberley Reef, where mining is carried on at a shallower depth, has an advantage over the Main Reef in that it can be mined at a cheaper cost. Recently the 17th level cross-cut from No. 6 Shaft intersected the Kimberley Reef at a depth of approximately 2,700 ft. and the 460 ft. sampled east and west from the cross-cut averaged 194 inch-dwt. over a channel width of 43 inches. These results indicate that this area is just above the pay limit and, as they occur at a depth where experience has led us to expect lower values, they can be regarded as encouraging for the levels above.

The available ore reserve increased during the year by 670,000 tons to the highly satisfactory total of 8,413,000 tons of an average value of 4.2 dwt. over 60.2 inches.

It is expected that over the next few years expenditure on capital account will average £250,000 a year and will be incurred mainly in connection with shaft sinking, ventilation and pumping. It is proposed to finance the programme out of profits and this will obviously continue to be a limiting factor in regard to the dividends that can be expected to be declared over the period.

The sinking and equipping of No. 6A Sub-Vertical Shaft will be completed within the next three months and Nos. 8 and 9 Incline Shafts on the Kimberley Reef, which had been sunk by the end of April to inclined depths of 1,751 and 1,097 ft. respectively, are being continued. With regard to the programme for the building of 48 further dwelling houses, 12 had been completed by the end of April and it is expected that 43 will have been finished by the end of 1955.

In the latest quarterly Report published last month, shareholders will have noticed the announcement that the company has purchased the freehold of about 516 morgen on which many of its mine houses and buildings are situated. The purchase price was some £65,000. As freehold owners the company will be in a position to realize the full value of the improvement on the land when mining activities eventually cease which would not have been the case if it did not own the freehold. Also, by virtue of the ownership of the freehold, the company will receive the estate owner's share of claim licence monies which are payable to the freehold owner in terms of the Gold Law.

The Report and Accounts were adopted.

RAND MINES, LIMITED

At the Sixtieth Annual Meeting of shareholders held in Johannesburg on May 13, 1955, **Mr. W. M. Frames**, the Chairman, in the course of his remarks said:—

The income was £712,900 a decrease of £13,200 compared with the figure for 1953. This income was derived from dividends, interest and sundry revenue. The decrease was, however, offset to a large extent by certain variations in the other items in the Profit and Loss Account, with the result that the profit for the year before taxation declined by only £3,900. After maintaining dividends at the previous year's level of 6/- per share, providing £12,000 for taxation and transferring £11,000 to Exploration Reserve, the unappropriated balance at the end of the year decreased by £1,900 to £1,882,800. The company's net liquid surplus at £2,386,900 reflected an increase of £703,800 as compared with the previous year's figure. In accordance with established practice, profits on the realization of investments were added to Investment Reserve Account which at the end of the year, stood at £6,331,500. Investments in shares and debentures were brought into account at book value of £6,573,000 which is a decrease of £188,200 compared with the total at the end of 1953.

THE GOLD MINING COMPANIES OF THE GROUP

You will have noted from the Schedule of Results obtained by the Witwatersrand and Orange Free State gold producing companies of the Central Mining-Rand Mines Group included in the report that, in the aggregate, both the tonnage milled and the yield increased modestly but, due to an increase of 1/2d. per ton milled in working costs, gold mining profits decreased by £578,300 against which there was an increase of £818,500 in uranium profit earned by Blyvooruitzicht.

The development accomplished during the year totalled 384,900 ft. which was 26,500 more than the corresponding figure for 1953. The available ore reserves of ten of the mines listed amounted to 36,838,700 tons—a decrease of 1,810,400 tons compared with the estimate for the previous year.

The Group's new Harmony mine in the Orange Free State commenced gold production in September last, and uranium plant testing operations commenced towards the end of March, 1955. Of the total of 14,825 ft. of reef sampled at the mine by the end of March, 1955, 13,720 ft., equal to 92.5 per cent., proved payable at an average of 615 inch-dwt. The installation of the second unit of the reduction plant, which will increase the capacity of the plant to 90,000 tons per month, is nearing completion and the tonnage milled is being steadily increased to that figure. The company's profit should shortly be augmented by a material contribution from uranium extraction operations.

With regard to the various South African industrial enterprises in which your company is interested, the outputs of the Witbank and Van Dyks Drift Collieries, although showing some improvement over the figures for the previous financial years, continued to be restricted by the inadequacy of the railway facilities. Exports of coal were again on a very small scale.

The Pretoria Portland Cement and its associated cement companies, earned higher net profits than in their previous financial years and continued steadily with their individual consolidation or expansion programmes. The Premier Cement company in Rhodesia has nearly completed its programme of expanding productive capacity by between 100,000 and 120,000 tons per annum and has recently, in association with others, acquired the entire share capital of the Northern Rhodesia Lime Company Ltd. which supplies the lime and limestone requirements of the Copper Belt from its works at Ndola. In addition, the Premier company has assumed responsibility for the management of the Chilanga Cement Company Ltd., which operates cement and lime factories near Lusaka, and is acquiring a substantial share interest in that company.

The Hume Pipe company maintained its trading operations satisfactorily. The company continues to modernize and expand its equipment and plant and is well placed to take full advantage of any increase in business activity.

The timber and forestry companies of the Central Mining-Rand Mines Group experienced another successful year marked by increased sales and further expansion of productive capacities.

The Northern Lime company's new works at Silver Streams successfully commenced production towards the end of 1954. The probable output commitments of the company are at present estimated to warrant the installation of a second and possibly a third rotary kiln at Silver Streams—the extent of this possible expansion and the method of its financing are being considered by the Board of the Northern Lime company.

It is with regret that I have to report the resignation in December last of Mr. W. H. A. Lawrence who became an alternate director of your Company in February, 1928, a director in March, 1929, and Chairman in January, 1948. On behalf of the Board of Directors and shareholders, I should like to thank Mr. Lawrence for his outstanding services to the company and his wise guidance of its affairs, and to extend to him all good wishes in his retirement.

The Report and Accounts were adopted.

EAST RAND PROPRIETARY MINES, LIMITED

At the fifty-ninth Annual Meeting of shareholders held in Johannesburg on May 10, 1955, **Mr. W. M. Frames**, the Chairman, in the course of his remarks said:—

The supply of Non-European labour improved appreciably during the year and the tonnage of ore milled increased by over 200,000 tons compared with the previous year's figure. Working costs increased by 11d. per ton milled and working profit was lower by 4d. per ton milled but owing to the higher tonnage milled, working profit increased in total by £79,425 to £1,522,281.

Satisfactory progress was achieved in the considerable programme of construction work associated with the expansion and the deepening of operations. The cost of this work, which is of a capital nature, is being and will continue to be met from profits.

VALUES GIVE ENCOURAGEMENT FOR FUTURE

The values encountered in advance development continued to give encouragement for the future. Shareholders will be particularly interested in the results obtained below the 8,000 ft. horizon in the Central area of the mine.

The 64th level reef drive was completed between the "D" and "H" sub-incline shafts and of the 6,840 ft. sampled 4,020 ft. equal to 59 per cent. were payable, assaying 15.9 dwt. per ton over 34 inches equal to 540 inch-dwt. The total footage sampled on this level up to the end of 1954 was 11,280 and of this, 7,030 or 62.1 per cent. were payable, assaying 14.3 dwt. per ton over 32 inches, equal to 457 inch-dwt.

Satisfactory values were obtained between "D" and "F" sub-incline shafts and another pilot winze "E" will be started from the 64th level, midway between these two shafts, 3,980 ft. were sunk in the whole series of pilot winzes during the year, of which 3,410 ft. were sampled and showed 74 per cent. payability, assaying 518 inch-dwt. As tabulated in the annual report, a total of 13,940 ft. had been sampled in these winzes by the end of 1954, of which 10,780 ft. or 77 per cent. were payable, assaying 16 dwt. over 36 inches or 575 inch-dwt.

The values exposed in the "K" and "L" winzes were well up to expectations and justified the start of the "L" sub-incline shaft.

The deepest reef exposure is 9,842 feet below surface in "H" pilot winze where all the footage sampled since the close of the year proved payable at an average of 729 inch-dwt. The "H" sub-incline shaft immediately below the winze is now 9,820 ft. below the surface. I am pleased to report that sinking and winzing at these great depths are being advanced at a satisfactory rate.

SUFFICIENT TONNAGE FOR FULL MILLING CAPACITY

Lest it should be thought that the small decrease in the ore reserve, in spite of the favourable development results, is of significance, I should again like to stress that this is a direct and relatively unimportant result of the curtailment of lateral development, which is necessary for the control of the hanging wall at these depths. What is important is that the longwall face lengths available for stoping in the assessed payable areas of the mine have been increased materially. Therefore, provided adequate labour is available, there should be no difficulty in supplying sufficient tonnage from the mine to maintain the mill at full capacity for very much longer than is indicated by the tonnage in the published available reserves.

As the average depth of stoping increases, owing to the exhaustion of the upper levels, a greater proportion of ore will

be mined from the indicated richer area below the 8,000 ft. horizon with beneficial effect on grade and profits.

Shareholders will have noted that preliminary work has commenced in connection with the sinking of the Far East Ventilation Shaft in the new lease area. This system, consisting of a vertical and a sub-vertical shaft, will serve the dual purpose of allowing early exploration of the Far Eastern section and of supplying the ventilation necessary for stoping operations in the area. The sinking of the South East Sub-Vertical Shaft has been completed and it is now being equipped for hoisting.

CAPITAL EXPENDITURE

It was expected that capital expenditure during 1954 would be of the order of £650,000 but the actual amount expended was £558,747. It is estimated that capital expenditure during the current year is unlikely to exceed £775,000 and will be incurred mainly on the sinking and equipping of shafts and on cooling and compressor plants. Capital expenditure will be substantially less in subsequent years.

The Report and Accounts were adopted.

CITY DEEP, LIMITED

At the fifty-fourth Annual Meeting of shareholders held in Johannesburg on May 10, 1955, **Mr. N. W. S. Lewin**, the Chairman, in the course of his remarks said:—

Due largely to an improvement in the Non-European labour supply the quantity of ore mined was higher than in the previous year with the result that, in spite of a slight decline in yield, the gold recovered increased by 2,209 ounces. Revenue was, however, lower by £5,310 because of the lower average revenue per ounce from sales of gold. Working costs increased by £137,061 and working profit decreased by the substantial amount of £142,371 to £175,885.

In the Annual Report under the heading of General Comments on the Position at the Mine, your attention was called to the difficult phase through which the mine is passing. Working costs include the cost of the sinking of the K line of shafts. These charges come to some 2/5d. per ton milled and they must continue for some years, although possibly on a declining scale, as individual shafts are completed. The equipping of these shafts is a capital charge and the Report advised you that £230,000 was the estimated sum that will be spent on capital account in the current year. Similar sums are likely to be spent for some years. You will be glad to know that there have been various stretches of the Main Reef Leader body along the bottom levels in the K line of shafts where payability and values are encouraging. This applies in particular towards the west of the property. From now on the rate of reef exposure in depth should increase, but a great deal of work remains to be done before the prospective tonnage and grade in the bottom levels can be accurately assessed. Unfortunately the profits over the last few months have decreased to marginal proportions due mainly to a further increase in working costs. Every effort is being made to raise the tonnage milled to the maximum with a view to increasing the profits, for, as you will appreciate, it will not be possible for the company with its present resources to finance for more than a few years the expected rate of capital expenditure unless profits improve. This question and the many and varied technical problems that face the management receive the constant and urgent attention of all parties concerned.

The Report and Accounts were adopted.

CROWN MINES, LIMITED

At the fifty-ninth Annual Meeting of shareholders held in Johannesburg on May 10, 1955, **Mr. P. H. Anderson**, the Chairman, in the course of his remarks said:—

In spite of the fact that milling has been in progress for 57 years Crown Mines is still one of the major units in the South African gold mining industry, the tonnage milled in 1954 being the highest in the industry and gold production being the fourth highest.

Quite clearly it is in the common interest that every effort should be made to prolong the profitable life of such an important unit in the country's economy.

The chances of survival must of course depend upon two main factors: firstly on the physical extent and nature of the ore body remaining to be mined and secondly on the economic conditions under which such mining will take place.

The physical nature of the orebody has deteriorated with depth, but while this is so, the effects of this deterioration have been aggravated by other considerations. One of these

has been a physical one, namely, the so called Vierfontein Dyke.

As a result of the presence in the Central and Eastern Sections of the mine of this 400 foot wide dyke and the accompanying 500 foot vertical displacement of the orebody, it would be necessary to carry out an extensive and costly modification of the existing system of incline shafts in order to (a) re-establish contact with the Main Reef Leader on the 9,500 foot horizon, (b) permit the exploration of the reef below this depth and (c) exploit it. Probing of the area by means of underground boreholes and winzing has been carried out but, judging from the results of this limited amount of work and the marginal values to the north of the dyke, there would appear to be but little encouragement, if any, to incur the heavy expenditure necessary to permit even a reasonably thorough exploration of this area of doubtful payability—at least under present economic conditions and trends.

The other factor which has aggravated the effects of the physical deterioration of the orebody at depth is an economic one, namely the ever-increasing costs of production. Part of this increase in working costs is attributable to increased depth itself. Higher rock temperatures call for increased cooling and ventilation, greater pressure calls for increased support, and a shorter working shift results from increased travelling time—to mention but a few of the contributory factors. Strenuous efforts have been made—and with no little success—to combat rising costs by increasing efficiency through mechanization and improved techniques.

The only real hope for any improvement in the future would, in the absence of an increase in the price of gold, therefore appear to lie in a reduction of costs, and as this cannot be done unilaterally by the gold mining industry, let alone by one unit in that industry, such a move can only spring from a concerted effort on the part of the country as a whole.

The Report and Accounts were adopted.

ROSE DEEP, LIMITED

MR. T. REEKIE IN THE CHAIR

At the fifty-ninth Annual Meeting of shareholders held in Johannesburg on May 9, 1955, Mr. T. Reekie, the Chairman, in the course of his remarks said:—

Reflecting the contraction in the scale of operations, the tonnage milled during the year under review dropped a further 26,000 tons due mainly to the exhaustion of the supply of surface accumulations and the depletion of ore reserves which limited the number of available working points. In view of the difficulty of finding sufficient stope faces to maintain the tonnage milled, the scale of operations since the beginning of the current year has been reduced to approximately 60,000 tons a month and the technical position at the mine may necessitate a further gradual decrease during the course of the year. The reduction plant has been converted to operate on an all slimming basis and it is expected that this modification will result in small improvements in reduction costs and gold residue values. The small clean-up plant erected to treat surface accumulations unsuitable for treatment in the reduction plant has operated with satisfactory results during the year. The decrease in both the European and Non-European labour strengths made possible by the reduction in the scale of operations from the beginning of this year is expected to have a beneficial effect on working costs.

As a result of the improved supply of Non-European underground labour particularly during the winter months of 1954, and the lower scale of stoping operations, more labour was available for development operations and the total footage accomplished increased by 1,486 feet. Reef development improved by 2,154 feet and the footage sampled by an equivalent amount. A few high values encountered on the Main Reef in the south eastern corner of the mine resulted in the value of the payable disclosures being higher by 11 inch-dwt. but the percentage payability dropped from 36.6 to 29.0 per cent. Development operations are now confined entirely to the southern areas of the property and as there remains only limited scope for such work in these areas, development footages and the tonnage of ore developed must be expected to decline.

During the course of the year there was a further cash repayment of capital amounting to 2s. a share thus reducing the issued capital of your company to £595,000 in 700,000 shares of 17/- each.

A special resolution reducing the Company's capital from £595,000 to £490,000 by repaying 3s. per share to shareholders was passed unanimously. The repayment will be made following the customary practice as soon as possible after the Court has confirmed the reduction in Capital.

The Report and Accounts were adopted.

MINING ENGINEER required for 3/6 months to investigate and report on African Ore. Apply Box No. 570, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2.

AUSTRALIA—UNIVERSITY OF SYDNEY

Applications are invited for appointment to a permanent SENIOR RESEARCH FELLOWSHIP IN COAL RESEARCH within the Department of Geology and Geophysics.

The appointee will be required to plan and undertake research on occurrence, nature, or utilization of coal. Applicants should be graduates in Science or Chemical Engineering, with experience in coal research.

The salary range will be £A1,200-£A1,750 and the salary will be subject to superannuation deductions. Applications, with details of qualifications, experience, names of referees, and enclosing a recent photograph, should reach the Registrar, University of Sydney, Sydney, New South Wales, Australia, by June 30, 1955. In addition, overseas candidates are requested to forward a copy of the application to the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1, by the same date.

WIGAN AND DISTRICT MINING AND TECHNICAL COLLEGE

Applications are invited for the following posts in the DEPARTMENT OF MINING AND GEOLOGY:

(1) *Head of Department.* The post will shortly become vacant through the retirement of Mr. Robert M. Chalmers, M.C., B.Sc., M.I.Min.E. Candidates should possess high academic qualifications, preferably an Honours Degree in Mining; practical mining experience; and teaching experience, preferably in a Technical College or University. Salary in accordance with Burnham Scale for Heads of Departments Grade III (£1,215-£25-£1,365). A salary above the minimum of the scale may be paid to a suitably qualified candidate.

(2) *Lecturer in Mining.* Candidates should possess a degree or a recognized diploma in Mining. Salary in accordance with the Burnham Technical Scale for Assistants Grade "B."

In both cases duties will commence on September 1, 1955, or as soon as possible thereafter.

Further particulars and application form will be sent by the undersigned on receipt of a stamped, addressed foolscap envelope. Applications not on the form provided will be disregarded. Last date for receipt of applications: Monday June 27, 1955. Candidates who have replied to a previous advertisement need not re-apply.

E. C. SMITH,
May 24, 1955. Principal.

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED

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GEOLOGISTS

Applications are invited from suitably qualified Geologists for senior posts in various parts of Southern Africa. The positions offer scope for a varied geological career within the organization and call for wide experience in Economic and Structural Geology. Duties consist mainly of exploration work, and preference will, therefore, be given to applications from unmarried men.

Vacancies also exist for Junior Geologists and recent graduates with first or second class honours degrees, for mine or field work. The majority of vacancies will be suitable only for single men. Minimum salaries of £80 per month are offered on a contract basis but there will be opportunities for transfer to the permanent staff of the Corporation, at rates of pay ranging from £68 per month, plus medical and pension fund benefits, etc. All mine appointments will be on the latter basis.

Applications, giving full personal particulars and details of education, qualifications, training and experience should be addressed to:—The Appointments Officer, Anglo American Corporation of South Africa, Limited, 11 Old Jewry, London, E.C.2.

Selected candidates will be interviewed by one of the Corporation's Consulting Geologists in late November.

BRITISH INSULATED CALLENDER'S CABLES

GROUP TURNOVER MAINTAINED

MR. W. H. McFADZEAN ON PROBLEM OF RISING COSTS

The 10th annual general meeting of British Insulated Callender's Cables Limited will be held on June 14 in London. The following is an extract from the statement by the Chairman and Managing Director, Mr. W. H. McFadzean, C.A. :—

Although Turnover of the Group has been maintained in total, Profit on Trading has fallen by £981,494 to £7,362,580, almost wholly due to lower profit rates. Many factors have contributed, but the two most important have been the uneven load and intensified competition.

The falling off in demand in the first part of 1954 largely applied to home business but the competition thus engendered was even more intensive throughout the whole year in export markets.

Competition is a challenge that must be accepted and your Group are meeting it by ever-increasing efficiency in technique, in production and indeed in every field of our activity.

Following the fall in Trading Profit one would have expected a decreased charge for Taxation. This charge is, however, little altered at the immense sum of £2,736,162 as the benefit of the decreased tax payable this year following the lower profits, has from a comparative point of view been offset by the special credits brought into the 1953 Accounts from (a) Excess Profits Levy Refund, and (b) the release of taxation provisions made in earlier years following settlement on several major outstanding points.

Stockholders will recall that although we are providing adequate Depreciation to write off the cost of our Fixed Assets such provision is insufficient to provide for their replacement at present prices. An up-to-date assessment shows the necessity of increasing the Reserve for replacement of Fixed Assets to £3,000,000 by the £500,000 now proposed.

Having in mind the heavy capital expenditure to which we are committed, the further strengthening of General Reserve by £500,000 is clearly desirable.

Your Directors also recommend the same distribution to Ordinary Stockholders as was made last year, namely, a Final Dividend of 7½% less income tax (making, with the interim of 2½% already paid, a total of 10% less income tax), plus a Special Distribution of 2½% free of income tax out of the "Realized Capital Profits Reserve". As this latter Reserve will then be reduced to £148,509 it will be appreciated that this is essentially a special distribution.

Total Assets now amount to almost £65,000,000 with Reserves of one and one-half times the Issued Capital.

COPPER

As one of the largest fabricators of copper in the world the BICC Group are vitally concerned with the supply and price of that metal. The supply position in this country during 1954 was normal, but the price increased substantially over the year and there were many wide fluctuations from day to day.

The problem of introducing greater stability into the copper market is continuing to receive the active consideration of many parties. I hope in the interests of the country and the Industry an early solution will be found.

At Home we have fully maintained the overall level of business done with the various Nationalized Industries and the numerous Industrial Concerns and Individuals who have all been our good customers for so many years.

Conditions in the export field are certainly difficult for in addition to competition, import into many countries is restricted through shortage of finance and/or the development of local manufacture.

The BICC Group, and in particular the Parent Company and our Construction Company, has played a leading part in the electrification of the World's railways.

Electrification of many more of the railways of the world is only a matter of time. Increasing loads and traffic, public demand for clean, fast transport, together with the necessity for economy in operation and conservation of fuel supplies, all point to this conclusion.

We were therefore particularly interested in the recent Report by the British Transport Commission on the modernization and re-equipment of British Railways.

We have made a good start to 1955 and in the absence of exceptional happenings I feel we can look forward to a satisfactory year.

BRITISH ROPES

The thirty-third annual general meeting of British Ropes Limited was held on May 25 in London.

Mr. Herbert Smith, the chairman, in the course of his speech said: The Group Trading profits follow very closely the results recorded for the two previous years, the amount of £1,904,000 for 1954 comparing with £1,830,000 for 1953, and £1,868,000 for 1952.

The total capital and revenue reserves of the Group, excluding amounts set aside, aggregated approximately £4,216,000 at December 31, 1954, an increase of £1,064,000 as compared with the previous year, and these reserves are now in total not far short of the Issued Preference and Ordinary Capitals of £4,295,000.

During 1954 the demand for wire increased considerably and this trend continues. Although the supply of steel rods was sufficient at the beginning of the year, we have had great difficulty in obtaining the volume required. The demand is really greater than the industry can meet until a more ample supply of steel is available. Our activities are therefore limited, although we are in fact manufacturing more than ever before.

Sales of Wire Rope in the Home market continue at a fairly steady level as regards total tonnage, but there have been marked changes in the demand for the different types of rope which have meant considerable changes and alterations to plant. The Export Trade in Wire Rope remains extremely competitive, but we are continuing to be major exporters and our experience over the last few years indicates that in many instances the performance of wire ropes is the predominating factor in achieving long term sales, and we feel confident of maintaining a higher level of exports.

The demand for our various fibre products remains steady with an increasing sale of Baler Twine, and with the continual increase in the use of Baling Machines a greater quantity is likely to be used, and our sales should increase.

With regard to Synthetic Cordage development, more raw material is becoming available, which naturally brings in its train added competition; nevertheless, your company continues to maintain its technical lead in the use of these materials.

The report was adopted and a final dividend of 11% on the Ordinary Stock (making 15% for the year) was approved.

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KONONGO GOLD MINES

The twenty-first annual general meeting of Konongo Gold Mines, Ltd., was held on May 24 in London. Mr. Robert Annan, M.I.M.M., Chairman, presided, and in the course of his speech said:—

The results for the year show an all-round improvement. The tonnage of ore treated for our own account increased by 4,500 tons and the grade by more than one pennyweight, resulting in an increase of £61,290 in revenue, in spite of a fall of 12/6d. per ounce in the price received for gold.

After providing for taxation, charging £16,769 for depreciation and £17,030 for the interim dividend paid last May, and bringing in the unappropriated balance from the previous accounts there is an available balance of £99,321. Out of this your directors recommend the payment of a dividend of 10 per cent less tax at 8/6d. in respect of the year ended September 30, 1954, which will absorb £35,607, leaving £63,714 to be carried forward. They have also declared an interim dividend in respect of the current year of 5 per cent. less tax, absorbing £17,802 net.

During the year 34,325 tons yielding 35,533 ounces of gold were milled for our account. This was an improvement of 4,515 tons and 6,601 ounces over the previous year. The recovery again improved to the very satisfactory figure of 95.58 per cent.

Development during the year amounted to 5,567 feet, an increase of 928 feet, and at the end of the year the ore reserve stood at 221,490 tons averaging 14.4 dwt. per ton, of which 32,435 tons averaging 9.8 dwt. is contained in pillars.

On the Zongo Reef the 10th Level has exposed 200 feet of ore averaging 9.0 dwt. over 98 inches. Both ends of this level have passed out of values. The 15th Level has been driven beyond the projected downward extension of the orebody on the 10th Level without disclosing payable values but is being continued to see if the ore-shoot may have pitched to the south-west.

At Boabedroo further development has been done on the 12th and 13th Levels. Development on the 13th Level is not yet complete but the values have increased again and the latest results show an aggregate length of 200 feet averaging 23.8 dwt. over 40 inches.

The 15th Level from the Odumase Shaft has now been extended through the hitherto unprospected stretch between the Odumase and Boabedroo orebodies without disclosing any new ore-shoots on the way. It has now reached the downward extension of the Boabedroo orebody at the horizon of the 14th Level. Development of the orebody at this level is not yet complete but the latest results show 220 feet of ore averaging 30.7 dwt. over 46 inches. The total length of ore developed between the 10th and 12th Levels was approximately 500 feet.

While exploratory development of the property has been in progress your directors have followed a conservative policy in dividend distribution and have built up reserves to ensure that funds would be available for the development of any new orebodies which might be discovered without the necessity of seeking additional capital.

In just over eighteen years of productive operation the results have been as follows:—

	£	%
Total working profit	3,213,900	100.0
Taxation and Minerals Duty	1,889,700	58.8
Net dividends after deduction of tax	676,500	21.0
Accumulated depreciation	345,700	10.8
Revenue reserve	302,000	9.4

Development has now reached a stage where, in the opinion of your directors, any new discoveries which might call for heavy capital expenditure are unlikely. Further development of existing orebodies can be continued in the normal way. Your directors, therefore, recommend that surplus funds should be utilized in making a repayment of capital to the extent of one shilling per share.

As to future operations, we shall continue milling at the rate of 45/50,000 tons per annum. Of this amount about 12,000 is at present being treated for the Lyndhurst company and should this supply cease at some future date it would be necessary to step up our own production by approximately a like amount in order to avoid a sharp increase in costs.

Development in depth of the Boabedroo and Zongo orebodies will, of course, be continued. The Boabedroo ore-shoot between the 10th and 12th Levels has been developing about 30,000 tons per hundred feet in depth and the Zongo ore-shoot at the 10th Level is about half this size. The extent to which they will add to ore reserves will depend on how far they extend in depth and maintain their present dimensions and value. This cannot be predicted and can only be determined by future development.

The report and accounts were adopted and at a subsequent extraordinary general meeting the board's capital proposals were approved.



Spanning the East

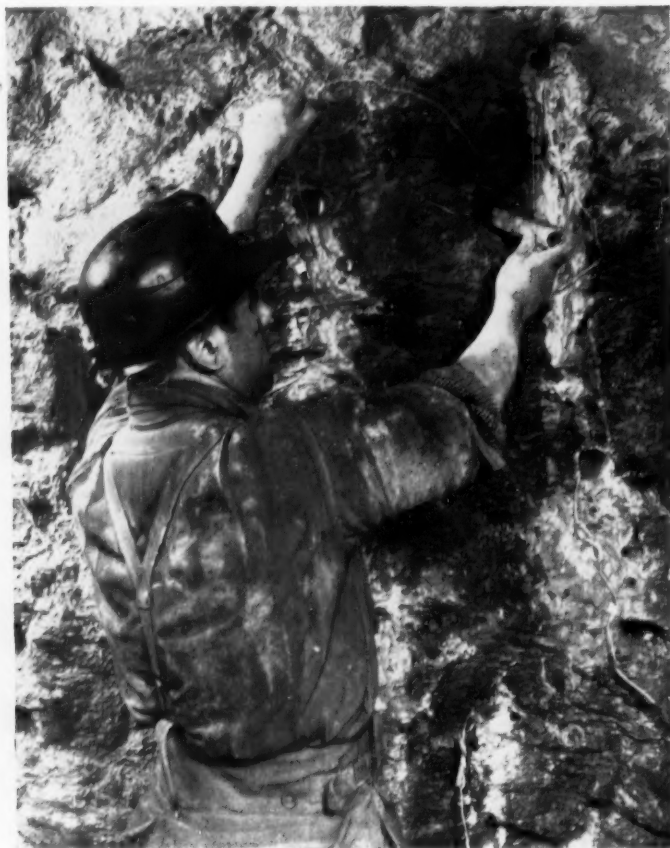
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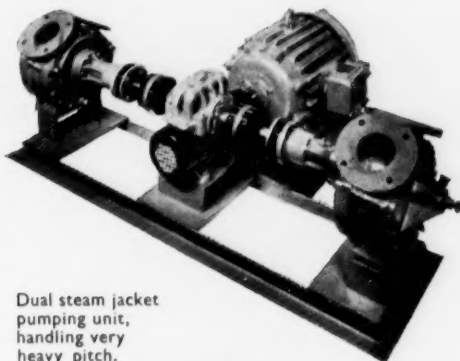
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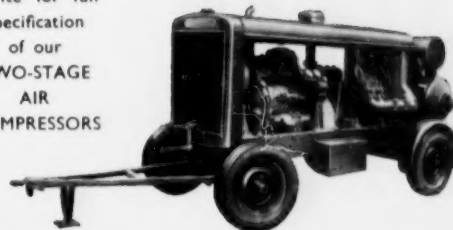
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- **Economic Review of the Metals**, which gives the past year's record and the outlook for over 30 of the more important metals including gold, platinum, copper, tin, lead, zinc, aluminium, chrome, manganese, tungsten, columbium, as well as metals of importance to atomic energy such as uranium, thorium, lithium, cobalt, titanium and beryllium.
- **Country by Country Review of the Mining Industry**, which records the political, economic and technical background to the progress of the mining industry in over 40 countries.
- **Progress Reports on over 100 of the British Commonwealth's Principal Mining Companies**. The articles in this section summarize the financial and technical performance of these mines over the past two or three years, and highlight the developments which may be expected in the months ahead.
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With illustrations by JOHN L. TURNER

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THIS book (now available for the first time at a "popular" price) has been specially written for the non-technical mining investor by two Johannesburg accountants in collaboration with a geologist and a mining engineer. It explains how to make full use of the wealth of geological, mining and statistical data, published monthly and quarterly, by the South African groups.

Such information, which is almost invariably reported and commented on in the financial and mining press, often presupposes a degree of knowledge not only of geology and of the techniques of prospecting and mining but also of the limits of economic mining and of the mathematics of share valuation, which many investors do not possess. It is this knowledge which *Economics of South African Gold Mining* supplies.

This book tips no shares, nor does it set out to evaluate the prospects for any particular mine. Its sole purpose is to present the essential background knowledge without which a considered view of this or that South African gold mining share is not possible. It does so in terms which the lay investor can understand, yet in sufficient detail to enable him to put the principles involved to practical use.

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